

City Of Weirton, West  
Virginia  
Policemen's Pension and  
Relief Fund

**Actuarial Valuation Report  
for the Year Beginning July 1, 2017**



September 28, 2018

Ms. Diana Smoljanovich  
Finance Director  
200 Municipal Plaza  
Weirton, WV 26062

Lt. Eric T. Redish  
Pension Board Secretary  
City of Weirton Policemen's Pension and Relief Fund

**Subject: City of Weirton Policemen's Pension and Relief Fund  
Actuarial Valuation Report for the Year Beginning July 1, 2017**

Dear Ms. Smoljanovich and Lt. Redish:

Upon the request of the Municipal Pensions Oversight Board, we have performed an actuarial valuation as of July 1, 2017, for the City of Weirton, West Virginia Policemen's Pension and Relief Fund ("Fund" or "Plan"). This actuarial valuation has been performed in accordance with the West Virginia Code Chapter 8, Article 22, Sections 16 through 28, inclusive.

In accordance with West Virginia Code §8-22-20, this actuarial valuation report provides information on:

- The sponsor's funding requirements for the fiscal year ending June 30, 2019, based on the selected funding policy, i.e. the Alternative funding policy as defined in West Virginia Code §8-22-20(c)(1)
- The Fund's eligibility to receive an allocation of the premium tax for the fiscal year ending June 30, 2019
- The Fund's eligibility to provide supplemental benefits for the plan year beginning July 1, 2019

This report also provides illustrative projections under two other funding policies available to the sponsor – the Optional funding policy as defined in West Virginia Code §8-22-20(e), and the Conservation funding policy as defined in West Virginia Code §8-22-20(f).

West Virginia Code §8-22-20 (c)(4), requires (1) a review of the actuarial assumptions and methods at least once every five years and (2) that the Actuary shall provide a report to the oversight board with recommendations on any changes to the actuarial process. Consequently, an experience review was performed for the period July 1, 2009, through June 30, 2014. The assumptions and methods were recommended by the actuary, in the report *2016 Experience Review for the Years July 1, 2009, to July 1, 2014*, approved by the Municipal Pensions Oversight Board, and became effective for the actuarial valuation as of July 1, 2015.

This actuarial valuation is based upon:

**Plan Member Data** – Data for active members and persons receiving benefits from the Fund as of June 30, 2017, was provided by the Fund's staff. We have tested this data for reasonableness.

**Asset Values** – A reconciliation of market value of assets during the plan year ended June 30, 2017, and a list of assets held as of June 30, 2017, by investment category, were provided by the Fund.

**Plan Provisions** – A summary of the key plan provisions valued are set forth in Section VII of the report: Summary of Principal Plan Provisions.

**Actuarial Methods** – Fund liabilities were measured using the Entry-Age Normal Actuarial Cost Method. The actuarial valuation was based on the market value of assets. The actuarial methods used in the actuarial valuation are set forth in Section VI of the report: Actuarial Assumptions and Methods.

**Actuarial Assumptions** – The actuarial assumptions used include a discount rate of 4.00%. The actuarial assumptions used in the actuarial valuation are set forth in Section VI of the report: Actuarial Assumptions and Methods.

The actuarial valuation results disclosed in this report are based on the data and actuarial assumptions and methods described above, and upon the provisions of the Plan as of the actuarial valuation date. Based on these items, we certify these results to be true and correct.

To the best of our knowledge, this actuarial statement is complete and accurate, and has been prepared in accordance with generally accepted actuarial principles and practices.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law.

This report should not be relied on for any purpose other than the purpose stated.



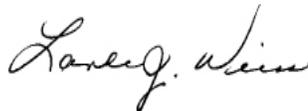
The signing actuaries are independent of the plan sponsor.

Alex Rivera and Lance J. Weiss are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein.

Sincerely,



Alex Rivera, FSA, EA, MAAA, FCA  
Senior Consultant



Lance J. Weiss, EA, MAAA, FCA  
Senior Consultant

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## **SECTION I**

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# **ACTUARIAL VALUATION RESULTS AS OF JULY 1, 2017**

# Executive Summary

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Upon the request of the Municipal Pensions Oversight Board (MPOB), we have performed an actuarial valuation as of July 1, 2017, for the City of Weirton, West Virginia Policemen's Pension and Relief Fund ("Fund" or "Plan").

In accordance with West Virginia Code §8-22-20, this actuarial valuation report provides information on:

- The sponsor's funding requirements for the fiscal year ending June 30, 2019
- The Fund's eligibility to receive an allocation of the premium tax for the fiscal year ending June 30, 2019
- The Fund's eligibility to provide supplemental benefits for the plan year beginning July 1, 2019

This report is based on the sponsor's election to finance benefit obligations using the Alternative funding policy as defined in West Virginia Code §8-22-20 (c)(1).

The key features of the Alternative funding policy, effective as of June 30, 1991, are summarized below:

- The sponsor's initial Alternative contribution effective for plan year 1991 is the greater of 107% of the amount contributed for the plan year ended June 30, 1990, or the highest five-year average of contributions made since 1984.
- Sponsor contributions made in subsequent years cannot be less than 107% of the contribution made in the prior fiscal year.
- The actuary must certify in writing that the Fund is projected to be solvent under the Alternative funding policy for the next consecutive 15-year period. A plan is deemed to be solvent if projected assets are greater than zero over the 15-year projection period.
- Beginning September 1, 2003, any municipality which elected the Alternative funding policy has the option of reverting to the Standard funding policy if the plan's funded ratio is greater than 80%. In this case, the Standard minimum contribution equals the normal cost plus the amortization of the unfunded liability over a period of not more than 40 years commencing from July 1, 1991, less the allocable portion of the state premium tax fund for municipal pension and relief funds.
- Plan members hired before January 1, 2010, contribute 7.0% of pay; however, if elected by the Board of Trustees of the Plan, member contributions may be increased up to 9.5% of pay. The Board elected to increase member contributions to 9.0% of pay. Employees hired on or after January 1, 2010, contribute 9.5% of pay.
- The Plan also receives premium tax allocation assigned to the Fund for the plan year.

This report also provides illustrative projections under two other funding policies available to the sponsor – the Optional funding policy as defined in West Virginia Code §8-22-20(e), and the Conservation funding policy as defined in West Virginia Code §8-22-20(f).

## Executive Summary (Continued)

The following table provides the Plan's funded status:

<b>Funded Status as of:</b>	<b>July 1, 2017</b>
Assets	\$5,070,148
Actuarial Accrued Liability	\$37,130,231
Unfunded Actuarial Accrued Liability	\$32,060,083
Funded Ratio	13.66%

The following table provides the employer contributions for the fiscal year ended June 30, 2018, under the Alternative funding policy:

<b>Employer Contributions for FYE:</b>	<b>June 30, 2018</b>
FYE 06/30/2017 Alternative Contribution	\$565,368
7% Increase in Alternative Contribution	\$39,576
FYE 06/30/2018 Alternative Contribution	\$604,944
Additional Contribution	\$0
Final FYE 06/30/2018 Alternative Contribution	\$604,944

For fiscal year end June 30, 2018, the sponsor is required to contribute an additional \$82,194 in order to grant additional Supplemental Benefits.

The following table provides the estimated employer contributions for the fiscal year ending June 30, 2019, under the Alternative funding policy:

<b>Estimated Employer Contributions for FYE:</b>	<b>June 30, 2019</b>
FYE 06/30/2018 Alternative Contribution	\$604,944
7% Increase in Alternative Contribution	\$42,346
FYE 06/30/2019 Alternative Contribution	\$647,290
Additional Contribution to satisfy 15-year Solvency Test on an Open Group Basis (to receive 100% of the State Premium Tax Allocation)	\$0
Estimated Employer Contribution for FYE 06/30/2019 to receive 100% of the State Premium Tax Allocation	\$647,290
Additional Contribution to satisfy 15-year Solvency Test on a Closed Group Basis (to grant Supplemental Benefits; i.e. COLA increases)	\$0
Estimated Employer Contribution for FYE 06/30/2019 to receive 100% of the State Premium Tax Allocation and to grant Supplemental Benefits; i.e. COLA increases	\$647,290

## Executive Summary (Continued)

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A sponsor using the Alternative funding policy must satisfy the solvency test, as referenced in West Virginia Code section §8-22-20 (c)(1) in order to receive 100% of the State premium tax allocation, or grant Supplemental Benefits to plan members. We understand that the minimum requirement to satisfy the statutory solvency test includes a demonstration that the assets are projected to be greater than zero over a 15-year period. The statutes also require that an actuary perform the projection and certify the solvency test. However, the statutes provide little guidance on the parameters used to perform the solvency projections.

Under the current minimum statutory requirements, a sponsor of a poorly funded plan could provide Supplement Benefits to members, effectively deplete assets over a 15-year period, and have no available assets reserved to pay the benefits of current or future retirees after the 15-year period. For this reason, we recommend performing projections that include a margin for conservatism and satisfy the minimum statutory requirement for solvency. For this purpose we recommend performing projections that assume contributions for members hired after the actuarial valuation date will not be used to finance the unfunded liabilities of current members as of the actuarial valuation date. That is, assets and liabilities associated with new plan members are excluded from the solvency projections used to certify the solvency test for purposes of providing Supplemental Benefits. In this report projections that exclude new members are called “Closed Group Projections.”

The statutes also require that the Plan satisfy the solvency test in order to receive the State premium tax allocation. For this purpose we recommend using less conservatism in the projections in order to ensure that the Plan receives the greatest allowable State premium tax allocation. A projection that includes assets and liabilities for members hired after the actuarial valuation would be less conservative. In this report projections that include new members are called “Open Group Projections.”

The sponsor is projected to satisfy the 15-year solvency test without making additional annual contributions in excess of the minimum alternative contribution. **However, given that the funded ratio as of June 30, 2017, is only 14% and is projected to decrease to 7% as of June 30, 2026, we strongly recommend that the sponsor continue to make additional contributions in excess of the statutory minimum.**

During fiscal year end June 30, 2017, the sponsor made a contribution of \$1,574,527 which significantly exceeded the statutory minimum of \$565,368. The excess contributions improved the funded status of the Plan and ultimately will reduce the overall costs to finance the program.

Because the 15-year solvency test is not consistent with generally accepted actuarial principles, we recommend that the sponsor make additional annual contributions, starting in fiscal year end June 30, 2019, equal to \$77,928, which increases by 7% per year each year thereafter. On a closed group basis, this is projected to maintain assets at no less than 50% of the value as of June 30, 2017, over the 40-year projection period (to a low of \$2,535,072 as of June 30, 2031) as shown in Table 1(d). Under this scenario, the funded ratio is projected to reach a minimum level of 9% in 2027 on an open group projection basis, as shown in Table 1(c).

## Executive Summary (Continued)

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### Commentary on Premium Tax Allocation

Under §8-22-19 of the West Virginia Code, the plan sponsor is required to deposit the statutory contribution on a monthly basis at a rate of one-twelfth of the annual requirement, in order to receive the premium tax allocation from the Municipal Pensions Security Fund. Revenues which are specifically collected for the Fund, including employee payroll contributions, must be deposited within five days of receipt.

Based upon discussions with the MPOB, we understand the annual premium tax allocation is determined by September 1<sup>st</sup> each year. Municipalities can begin invoicing the MPOB for their share of the premium tax allocation after receiving their state provided actuarial study and after the municipality has made employer contributions to the local Plan. Each municipal treasurer shall use the invoice template provided by the MPOB to begin drawing down the state allocation for the municipal pension plan. This July 1, 2017, Actuarial Report from GRS is to be used by municipal pension plans to draw down the September 1, 2018 State Premium Tax Allocation which is allocated in Fiscal Year 2019. The actuarial valuation and projection results assume the sponsor will make the statutory contributions on a monthly basis in accordance with statutes, including any additional amounts needed to satisfy the 15-year solvency test on an open group projection basis, and will be eligible to receive the premium tax allocation.

### Commentary on Solvency Projections and Supplemental Benefits

Under § 8-22-26a of the West Virginia Code, all retirees, surviving spouses, and disabled pensioners are eligible for Supplemental Benefits that include automatic cost-of-living benefits commencing on the first day of July following two years of retirement. The benefit equals the percentage increase in the Consumer Price Index, limited to 4.0 percent (2.0 percent for certain disabled pensioners), multiplied by the sum of the allowable amount (first \$15,000 of initial benefits paid) and the accumulated supplemental pensions paid in prior years.

The Court of Appeals decision requires that Supplemental Benefits be provided on “the allowable amount of the first \$15,000 of the total annual pension paid in addition to the accumulated supplemental pension from the previous years.” The decision implies that compound cost-of-living increases should be applied to both the allowable amount of \$15,000 and the accumulated supplemental pension amounts for prior years. Additional Supplemental Benefits are payable only if the Plan satisfies the minimum standard for actuarial soundness as defined in West Virginia Code § 8-22-20. This minimum standard requires that the fund remain “solvent” over the next 15-year projection period. Based on discussions with the West Virginia Municipal Pensions Oversight Board, and our understanding of the administrative practices of other local police and fire pension funds in West Virginia, the “solvency” requirement generally means that the fund’s market value of assets is projected to be greater than zero for all plan years prior to the end of the 15-year projection period. The projection is based on the most recent actuarial valuation and assumes the plan sponsor will make contributions according to the funding policy elected by the sponsor as defined by West Virginia Code, including any additional amounts needed to satisfy the 15-year solvency test on a closed group projection basis. Although the 15-year solvency test may satisfy the minimum standard for actuarial soundness under the statutes, it is not necessarily consistent with generally accepted actuarial principles.

The Supplemental benefits for plan year beginning July 1, 2019 will be based on the Consumer Price Index for calendar year 2018, and the projected results of the July 1, 2017 actuarial valuation.

# Executive Summary (Continued)

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## Additional Remarks on the Actuarial Valuation Results

Following are additional remarks on the actuarial valuation results as of July 1, 2017:

- The actuarial assumptions and methods were recommended by the actuary, in the report *2016 Experience Review for the Years July 1, 2009, to July 1, 2014*, and approved by the Municipal Pensions Oversight Board and became effective beginning with the actuarial valuation as of July 1, 2015. The key actuarial assumptions are fully disclosed in Section VI of the report.
- The interest rate used to discount liabilities remained the same for the July 1, 2016 and July 1, 2017 actuarial valuations.
  - The interest rate assumption was developed by reviewing the Plan's current funded ratio, the 15-year projected funded ratio, the ratio of assets to benefits, the percentage of assets allocated to equities and the funding policy selected. The details of the methodology used to select the discount rate are presented in Section VI of the report. As of July 1, 2017, the Plan's funded ratio of 17% (using a testing interest rate of 5.50% for all plans using the Alternative funding policy), ratio of assets to benefits of 3.30, equity allocation of 54%, and 15-year projected funded ratio of 12%, resulted in a discount rate assumption of 4.00%.
- The Fund experienced an approximate annualized return of 9.95% on the market value of assets during the plan year ended June 30, 2017, which compares to the expected annualized return of 4.00%. The difference in actual versus expected return produced an asset (gain)/loss of (\$257,728).
- An actuarial valuation is based on the expectation of certain events such as salary increases, retirement, disability, mortality, termination, and cost of living increases. Demographic or liability experience (gains)/losses are generated when the actual occurrence of such events differs from the expectation. During the plan year ended June 30, 2017, the fund experienced a net liability (gain)/loss of (\$461,729) due to these events.

## Alternative Funding

Following are additional remarks on the actuarial valuation projections under the current funding policy.

Based on the open group projections shown in Table 2, page II-2 and assuming that the sponsor makes the statutory required contributions, if all actuarial assumptions are realized in the future, including an investment return of 4.00%:

- The funded ratio is projected to decrease from 14% at June 30, 2017, to 7% at June 30, 2026, and then increase slowly to 9% at June 30, 2035, and then increase to 63% at June 30, 2057.
- Employer contributions are expected to increase from \$604,944 (or 32% of pay) for the fiscal year end June 30, 2018, to \$8,466,093 (or 106% of pay) for fiscal year end June 30, 2057.

Please note that a funded ratio of only 14% at June 30, 2017, which is projected to decrease to 7% as of June 30, 2026, means that the plan is severely underfunded.

The Alternative funding policy is not consistent with generally accepted actuarial principles because it does not recognize emerging gains or losses.

A funding policy consistent with generally accepted actuarial principles is typically based on the sponsor contributing the normal cost net of employee contributions plus an amortization of the unfunded

## Executive Summary (Continued)

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actuarial accrued liability. The annual amortization amount is generally 6% to 7% of the unfunded actuarial accrued liability. Under state statute, the annual premium tax allocation can only be used to finance the amortization of the unfunded actuarial accrued liability. For fiscal year end 2019, the Alternative funding policy contribution of \$647,290 is sufficient to finance only 66% of the net employer normal cost of \$981,150. The state premium tax allocation of \$390,069 is sufficient to finance only 1.2% of the unfunded actuarial accrued liability of \$32,060,083.

This actuarial valuation assumes that the City will be able to make future contributions on a timely basis. The ability of the plan to become funded is heavily dependent on the City contributing the minimum employer contribution calculated under the Alternative funding policy for each and every future year. We did not perform an analysis of the ability of the City to make future contributions. Such an analysis is not within the scope of our assignment or within our analytical skill set. Failure to receive City contributions on a timely basis could jeopardize the sustainability of the Fund.

Please understand that minimum employer contribution calculated under the Alternative funding policy as defined in West Virginia Code 8-22-20 (c)(1) is just that – the minimum that needs to be contributed each and every year. Because this is a severely underfunded plan, we continue to recommend that the plan sponsor consider making additional contributions (in excess of the minimum requirement) to ensure that there are sufficient assets available in the fund in all years to pay the promised benefits.

If the minimum employer contributions (calculated under the Alternative funding policy) are not made or investment return is less than the assumption of 4.00%, the funded ratio will be lower and the cash flow strain could be higher. If another significant market downturn occurs while the plan's funded ratio is declining, the plan may need to liquidate assets in order to pay benefits which could have a further adverse effect on the funded status of the System.

Under the Alternative funding policy, City contributions increase by seven percent and do not change as a result of emerging actuarial experience. However, emerging experience gains and losses could impact the Plan's funded ratio as follows:

- If the actual return on assets is *less* than the assumed return of 4.00%, then the funded ratio will *decrease*. Conversely, if the actual return on assets is *greater* than the assumed return of 4.00% then the funded ratio will *increase*.
- If salaries *increase* by more than assumed, the funded ratio could *decrease*. If salaries *decrease* by more than assumed, the funded ratio could *increase*.
- If active members retire *sooner* than expected, the funded ratio will generally *decrease*. If active members retire *later* than expected, the funded ratio will generally *increase*.
- If active members become disabled during the year, the funded ratio could *decrease*.
- If retired members die *later* than expected, the funded ratio will *decrease*. If retired members die *sooner* than expected, the funded ratio will *increase*.
- If the general inflation is *greater* than assumed, supplemental benefits will be greater than assumed and the funded ratio will *decrease*. Conversely, if general inflation is *lower* than assumed, the funded ratio will *increase*.

At least once every five years, GRS performs an experience review analysis and updates the actuarial valuation assumptions. For example, if salary increases were consistently lower than assumed during the experience period, then the salary increase rate would likely be lowered. Or if more members retired than assumed, then the retirement rates would likely be increased. Any change in actuarial assumption will also impact the City's funded ratio. The objective of a change in assumptions is to reduce the level of experience gains and losses in future actuarial valuations.

## Schedule A: Summary of Key Valuation Results

Valuation Date	<b>July 1, 2016</b>		<b>July 1, 2017</b>	
Valuation Interest Rate	4.00%		4.00%	
Cost-of-Living Adjustment	2.75%		2.75%	
Wage Inflation	3.75%		3.75%	
Expected Payroll	\$1,740,164		\$1,907,577	
Average Pay	\$51,181		\$51,556	
Expected Benefit Payments	\$1,580,422		\$1,538,685	
<b>1. Actuarial Accrued Liability</b>	<u>No.</u>		<u>No.</u>	
(a) Actives	34	\$11,326,146	37	\$12,575,330
(b) Retirees	39	\$22,674,647	36	\$21,890,687
(c) Survivors	9	\$1,802,770	10	\$1,880,034
(d) Disabled Members	2	\$793,547	2	\$784,180
(e) Deferred Vested Members	0	\$0	0	\$0
(f) Total	84	\$36,597,110	85	\$37,130,231
<b>2. Present Value of Future Normal Costs</b>		\$11,665,499		\$12,626,665
<b>3. Present Value of Benefits (1(f) + 2)</b>		\$48,262,609		\$49,756,896
<b>4. Market Value of Assets</b>		\$4,028,173		\$5,070,148
<b>5. Unfunded Actuarial Accrued Liability (1(f) - 4)</b>		\$32,568,937		\$32,060,083
<b>6. Funded Ratio (4 / 1(f))</b>		11.01%		13.66%
<b>7. Net Employer Normal Cost</b>				
(a) Normal Cost		\$1,060,016		\$1,153,764
(b) Administrative Expenses		\$2,681		\$2,131
(c) Gross Normal Cost (a + b)		\$1,062,697		\$1,155,895
(d) Employee Contribution Rate <sup>a</sup>		9.12%		9.16%
(e) Expected Employee Contributions		\$158,740		\$174,745
(f) Net Employer Normal Cost (c - e)		\$903,957		\$981,150
( % of Compensation)		51.95%		51.43%
		<b>FYE 2018</b>		<b>FYE 2019</b>
<b>8. Estimated Minimum Employer Contribution <sup>b</sup></b>				
(a) Prior Year Alternative Contribution		\$565,368		\$604,944
(b) Increase in Alternative Contribution		7.00%		7.00%
(c) Current Year Alternative Contribution		\$604,944		\$647,290
(d) Additional Contribution <sup>c</sup>		\$0		\$0
(e) Alternative Contribution ( c + d )		\$604,944		\$647,290

<sup>a</sup> Blended rate reflecting 9.0% for members hired before January 1, 2010, and 9.5% for members hired after January 1, 2010.

<sup>b</sup> Estimated Minimum Employer Contribution is based on Alternative funding policy and is assumed to be made in plan year ending June 30, 2019.

<sup>c</sup> For fiscal year end June 30, 2018, the sponsor is not required to make additional contributions in order to receive 100% of the State Premium Tax Allocation, but is required to contribute an additional \$82,914 in order to grant additional Supplemental Benefits. For fiscal year end June 30, 2019, the sponsor is not required to make additional contributions in order to receive 100% of the State Premium Tax Allocation, or grant additional Supplemental Benefits.

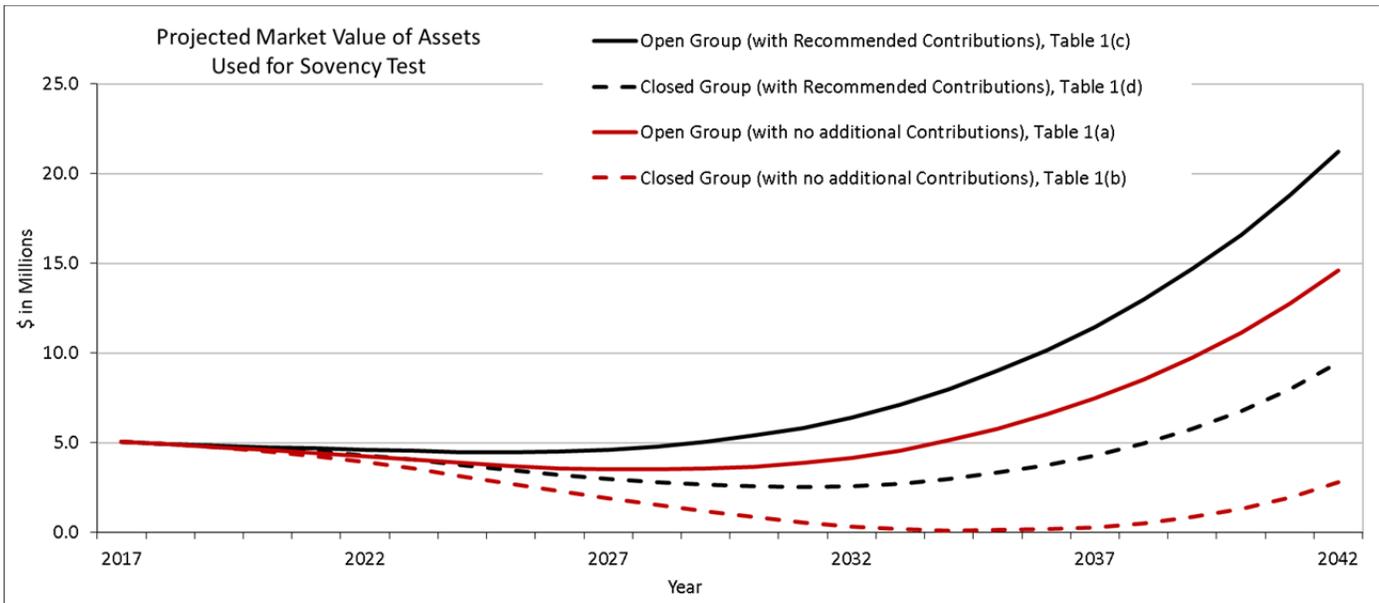
## Schedule B: (Gain)/Loss Analysis

### Experience (Gain)/Loss for Plan Year Ended June 30, 2017

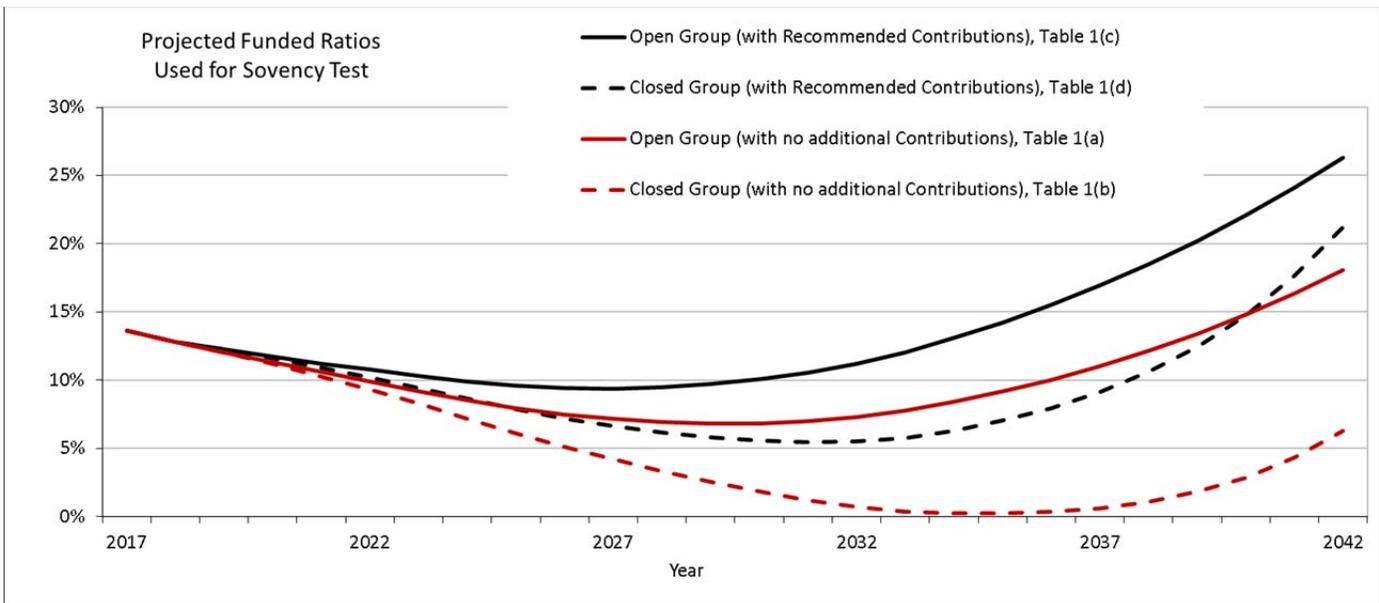
1. (a) Actuarial Accrued Liability as of 7/1/2016	\$36,597,110
(b) Normal Cost due 7/1/2016	\$1,060,016
(c) Interest on (a) and (b) to 6/30/2017	\$1,485,085
(d) Benefit Payments with interest to 6/30/2017	\$1,550,251
(e) Effect of Assumption Changes	\$0
(f) Expected Liability at 7/1/2017 [(a) + (b) + (c) - (d) + (e)]	\$37,591,960
(g) Actual Liability at 7/1/2017	\$37,130,231
(h) Liability (Gain)/Loss [(g) - (f)]	<b>(\$461,729)</b>
2. (a) Market Value of Assets as of 7/1/2016	\$4,028,173
(b) Interest on (a) to 6/30/2017	\$161,127
(c) Contributions with interest to 6/30/2017	\$2,173,371
(d) Benefit Payments with interest to 6/30/2017	\$1,550,251
(e) Expected Assets at 6/30/2017 [(a) + (b) + (c) - (d)]	\$4,812,420
(f) Actual Assets at 7/1/2017	\$5,070,148
(g) Asset (Gain)/Loss [(e) - (f)]	<b>(\$257,728)</b>
3. Total (Gain)/Loss [1(h) + 2(g)]	<b>(\$719,457)</b>

# Graphs 1A and 1B: Solvency Projections

## Graph 1A



## Graph 1B



## **SECTION II**

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**ACTUARIAL PROJECTIONS**

**ALTERNATIVE FUNDING POLICY**

# Alternative Funding on an Open Group Basis, Table 1(a) (with no Additional Contributions)

Valuation Plan Year End	Number		Total Assets											Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
	Pay	Status	Total Payroll	Assets (boy)	Benefit Payments	Employer Expenses	Member Contributions	Premium Tax Allocation Contributions	Investment Income	Assets (eoy)	Funded Ratio					
												Active				
2017	37	48	\$1,740,164	\$4,028,172	\$1,519,854	\$2,074	\$1,574,527	\$175,462	\$380,767	\$433,148	\$5,070,148	\$37,130,231	\$32,060,083	14%		
2018	37	49	1,907,577	5,070,148	1,538,685	2,131	604,944	174,745	399,687	195,648	4,904,356	38,223,463	33,319,107	13%		
2019	37	50	1,978,694	4,904,356	1,567,403	2,223	647,290	182,676	390,069	189,251	4,744,016	39,367,523	34,623,507	12%		
2020	37	51	2,041,400	4,744,016	1,626,878	2,308	692,600	189,053	408,400	183,044	4,587,928	40,529,124	35,941,196	11%		
2021	37	53	2,094,311	4,587,928	1,704,821	2,402	741,082	194,670	420,811	176,572	4,413,841	41,681,753	37,267,912	11%		
2022	37	53	2,181,750	4,413,841	1,771,323	2,508	792,958	203,617	434,505	169,766	4,240,856	42,857,138	38,616,282	10%		
2023	37	55	2,229,446	4,240,856	1,851,318	2,596	848,465	208,602	446,478	162,696	4,053,182	44,017,032	39,963,850	9%		
2024	37	56	2,320,228	4,053,182	1,934,820	2,716	907,858	218,295	462,273	155,213	3,859,285	45,181,725	41,322,440	9%		
2025	37	56	2,425,405	3,859,285	1,988,463	2,809	971,408	228,619	475,267	148,114	3,691,420	46,394,317	42,702,897	8%		
2026	37	56	2,540,648	3,691,420	2,028,722	2,894	1,039,407	239,940	487,505	142,414	3,569,069	47,678,082	44,109,013	7%		
2027	37	56	2,663,970	3,569,069	2,059,622	2,973	1,112,165	251,976	499,354	138,820	3,508,789	49,051,768	45,542,979	7%		
2028	37	56	2,758,970	3,508,789	2,108,118	3,047	1,190,017	261,496	511,121	137,410	3,497,668	50,484,362	46,986,694	7%		
2029	37	56	2,887,345	3,497,668	2,160,330	3,147	1,273,318	274,658	526,071	138,135	3,546,373	51,993,663	48,447,290	7%		
2030	37	56	3,008,518	3,546,373	2,206,797	3,231	1,362,450	286,698	539,004	141,422	3,665,918	53,585,567	49,919,649	7%		
2031	37	56	3,134,508	3,665,918	2,254,958	3,321	1,457,822	299,464	552,820	147,663	3,865,408	55,265,211	51,399,803	7%		
2032	37	56	3,265,698	3,865,408	2,300,606	3,409	1,559,870	312,694	566,737	157,296	4,157,989	57,042,001	52,884,012	7%		
2033	37	55	3,420,798	4,157,989	2,337,419	3,499	1,669,061	328,202	581,605	171,031	4,566,970	58,943,859	54,376,889	8%		
2034	37	55	3,588,451	4,566,970	2,356,779	3,579	1,785,895	344,699	595,263	189,917	5,122,386	61,001,401	55,879,015	8%		
2035	37	55	3,700,721	5,122,386	2,416,518	3,656	1,910,908	356,161	609,541	213,934	5,792,757	63,147,232	57,354,475	9%		
2036	37	55	3,823,840	5,792,757	2,509,139	3,768	2,044,672	369,370	628,370	242,197	6,564,459	65,357,900	58,793,441	10%		
2037	37	55	3,973,390	6,564,459	2,588,960	3,880	2,187,799	383,534	647,165	274,969	7,465,086	67,666,213	60,201,127	11%		
2038	37	55	4,119,107	7,465,086	2,660,813	3,982	2,340,945	396,079	665,727	313,218	8,516,261	70,078,298	61,562,037	12%		
2039	37	55	4,269,909	8,516,261	2,724,717	4,090	2,504,811	409,389	685,146	357,890	9,744,690	72,598,822	62,854,132	13%		
2040	37	55	4,409,741	9,744,690	2,803,682	4,201	2,680,148	421,078	705,282	409,564	11,152,879	75,210,920	64,058,041	15%		
2041	37	55	4,567,347	11,152,879	2,884,282	4,326	2,867,758	434,745	727,239	468,714	12,762,728	77,922,226	65,159,498	16%		
2042	37	56	4,729,750	12,762,728	2,961,073	4,445	3,068,501	448,705	748,860	536,265	14,599,541	80,742,422	66,142,881	18%		
2043	37	56	4,889,266	14,599,541	3,052,543	4,569	3,283,296	461,904	770,886	612,875	16,671,389	83,661,404	66,990,015	20%		
2044	37	56	5,047,510	16,671,389	3,154,497	4,700	3,513,127	475,627	794,117	699,011	18,994,074	86,665,882	67,671,808	22%		
2045	37	56	5,204,895	18,994,074	3,276,854	4,836	3,759,046	489,472	817,842	795,107	21,573,851	89,743,562	68,169,711	24%		
2046	37	56	5,363,831	21,573,851	3,411,827	4,975	4,022,179	503,834	842,165	901,599	24,426,826	92,888,328	68,461,502	26%		
2047	37	56	5,544,996	24,426,826	3,543,252	5,116	4,303,732	520,493	866,945	1,019,509	27,589,137	96,122,908	68,533,771	29%		
2048	37	56	5,725,722	27,589,137	3,678,030	5,251	4,604,993	536,928	891,155	1,150,100	31,089,032	99,451,651	68,362,619	31%		
2049	37	56	5,921,270	31,089,032	3,815,838	5,393	4,927,343	555,485	916,287	1,294,613	34,961,530	102,883,145	67,921,615	34%		
2050	37	55	6,131,977	34,961,530	3,949,608	5,531	5,272,257	575,461	941,315	1,454,583	39,250,007	106,438,461	67,188,454	37%		
2051	37	55	6,354,830	39,250,007	4,082,181	5,671	5,641,315	596,901	966,504	1,631,726	43,998,602	110,131,261	66,132,659	40%		
2052	37	55	6,592,011	43,998,602	4,214,945	5,811	6,036,207	620,100	992,032	1,827,823	49,254,008	113,977,354	64,723,346	43%		
2053	37	55	6,843,986	49,254,008	4,347,792	5,952	6,458,741	644,772	1,017,868	2,044,774	55,066,419	117,993,324	62,926,905	47%		
2054	37	54	7,110,961	55,066,419	4,479,395	6,094	6,910,853	670,375	1,044,017	2,284,641	61,490,816	122,196,158	60,705,342	50%		
2055	37	54	7,386,722	61,490,816	4,610,712	6,237	7,394,613	696,255	1,070,697	2,549,634	68,585,066	126,597,006	58,011,940	54%		
2056	37	54	7,673,365	68,585,066	4,743,706	6,387	7,912,236	723,566	1,098,557	2,842,111	76,411,442	131,203,016	54,791,574	58%		
2057	37	53	7,974,965	76,411,442	4,883,461	6,544	8,466,093	752,221	1,127,630	3,164,507	85,031,888	136,025,525	50,993,637	63%		

## Alternative Funding on a Closed Group Basis, Table 1(b) (with no Additional Contributions)

Valuation Plan Year End	Number		Total Assets											Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
	Active	Pay Status	Total Payroll	Assets	Benefit	Employer	Member	Premium Tax	Investment	Assets	Actuarial	Unfunded	Funded			
				(boy)	Payments	Expenses	Contributions	Contributions	Allocation	Income						
2017	37	48	\$1,740,164	\$4,028,172	\$1,519,854	\$2,074	\$1,574,527	\$175,462	\$380,767	\$433,148	\$5,070,148	\$37,130,231	\$32,060,083	14%		
2018	34	49	1,907,577	5,070,148	1,538,685	2,131	604,944	174,745	399,687	195,648	4,904,356	38,223,463	33,319,107	13%		
2019	31	50	1,858,501	4,904,356	1,567,403	2,141	647,290	170,316	390,069	189,008	4,731,495	39,296,483	34,564,988	12%		
2020	29	51	1,800,750	4,731,495	1,626,447	2,154	692,600	165,095	365,848	181,238	4,507,675	40,313,634	35,805,959	11%		
2021	26	53	1,718,772	4,507,675	1,703,169	2,172	741,082	157,707	357,909	171,422	4,230,455	41,237,335	37,006,880	10%		
2022	24	53	1,649,833	4,230,455	1,767,861	2,192	792,958	151,510	349,073	159,781	3,913,725	42,083,658	38,169,933	9%		
2023	21	55	1,563,581	3,913,725	1,845,406	2,214	848,465	143,769	344,421	146,430	3,549,190	42,823,978	39,274,788	8%		
2024	19	56	1,470,443	3,549,190	1,925,985	2,238	907,858	135,421	335,826	131,093	3,131,166	43,445,811	40,314,645	7%		
2025	18	56	1,422,924	3,131,166	1,976,075	2,261	971,408	131,191	332,115	114,481	2,702,025	44,006,367	41,304,342	6%		
2026	16	56	1,395,328	2,702,025	2,012,117	2,285	1,039,407	128,761	330,105	97,860	2,283,756	44,530,749	42,246,993	5%		
2027	16	55	1,384,627	2,283,756	2,038,370	2,310	1,112,165	127,858	329,888	82,027	1,895,014	45,038,974	43,143,960	4%		
2028	14	56	1,349,627	1,895,014	2,081,803	2,334	1,190,017	124,776	330,818	67,116	1,523,604	45,498,381	43,974,777	3%		
2029	13	56	1,304,056	1,523,604	2,128,649	2,359	1,273,318	120,749	329,225	52,870	1,168,758	45,896,899	44,728,141	3%		
2030	12	56	1,268,637	1,168,758	2,169,164	2,384	1,362,450	117,644	329,467	39,582	846,352	46,245,634	45,399,282	2%		
2031	11	55	1,225,127	846,352	2,210,809	2,409	1,457,822	113,821	329,689	27,677	562,144	46,537,133	45,974,989	1%		
2032	10	55	1,183,611	562,144	2,249,518	2,433	1,559,870	110,189	330,460	17,506	328,218	46,773,672	46,445,454	1%		
2033	9	55	1,157,135	328,218	2,278,739	2,458	1,669,061	107,917	331,924	9,717	165,640	46,972,438	46,806,798	0%		
2034	9	54	1,153,870	165,640	2,289,808	2,482	1,785,895	107,738	334,418	5,354	106,754	47,164,360	47,057,606	0%		
2035	8	54	1,095,372	106,754	2,340,746	2,505	1,910,908	102,433	337,951	4,430	119,224	47,276,183	47,156,959	0%		
2036	6	54	977,937	119,224	2,423,927	2,526	2,044,672	91,649	338,235	5,722	173,048	47,237,070	47,064,022	0%		
2037	5	54	874,932	173,048	2,493,428	2,547	2,187,799	82,214	338,704	9,155	294,945	47,065,068	46,770,123	1%		
2038	5	54	784,129	294,945	2,553,777	2,567	2,340,945	73,877	340,560	15,740	509,723	46,772,626	46,262,903	1%		
2039	4	53	701,205	509,723	2,600,819	2,584	2,504,811	66,178	342,456	26,529	846,295	46,372,363	45,526,068	2%		
2040	3	53	609,739	846,295	2,649,111	2,598	2,680,148	57,615	344,408	42,377	1,319,134	45,853,526	44,534,392	3%		
2041	3	52	525,762	1,319,134	2,686,845	2,609	2,867,758	49,733	345,790	64,129	1,957,091	45,226,517	43,269,426	4%		
2042	2	51	463,069	1,957,091	2,704,814	2,616	3,068,501	43,848	347,741	93,189	2,802,939	44,519,565	41,716,626	6%		
2043	2	50	399,737	2,802,939	2,721,424	2,620	3,283,296	37,879	349,352	130,861	3,880,283	43,731,334	39,851,051	9%		
2044	1	49	337,156	3,880,283	2,734,336	2,620	3,513,127	31,966	350,788	178,162	5,217,370	42,863,628	37,646,258	12%		
2045	1	48	270,307	5,217,370	2,747,320	2,616	3,759,046	25,642	351,664	236,152	6,839,937	41,911,919	35,071,982	16%		
2046	1	46	203,160	6,839,937	2,756,526	2,608	4,022,179	19,284	352,044	305,964	8,780,274	40,877,673	32,097,399	21%		
2047	1	45	153,175	8,780,274	2,746,748	2,597	4,303,732	14,547	352,090	389,254	11,090,553	39,786,167	28,695,614	28%		
2048	0	44	111,957	11,090,553	2,728,003	2,581	4,604,993	10,636	351,807	487,921	13,815,326	38,649,727	24,834,401	36%		
2049	0	42	75,285	13,815,326	2,703,287	2,561	4,927,343	7,152	351,106	603,703	16,998,782	37,475,359	20,476,577	45%		
2050	0	41	51,918	16,998,782	2,664,056	2,538	5,272,257	4,932	349,901	738,581	20,697,859	36,282,459	15,584,600	57%		
2051	0	39	35,404	20,697,859	2,618,142	2,512	5,641,315	3,363	348,245	894,698	24,964,827	35,080,606	10,115,779	71%		
2052	0	38	23,966	24,964,827	2,567,372	2,482	6,036,207	2,277	346,226	1,074,142	29,853,824	33,876,927	4,023,103	88%		
2053	0	36	15,422	29,853,824	2,513,806	2,451	3,767,022	1,465	343,778	1,225,760	32,675,592	32,675,592	0	100%		
2054	0	35	9,496	32,675,592	2,457,903	2,416	5,765	902	0	1,258,432	31,480,372	31,480,372	0	100%		
2055	0	33	5,286	31,480,372	2,400,557	2,380	4,198	502	0	1,211,720	30,293,855	30,293,855	0	100%		
2056	0	32	2,572	30,293,855	2,342,142	2,343	3,189	244	0	1,165,392	29,118,196	29,118,196	0	100%		
2057	0	31	1,304	29,118,196	2,282,841	2,304	2,712	124	0	1,119,529	27,955,417	27,955,417	0	100%		

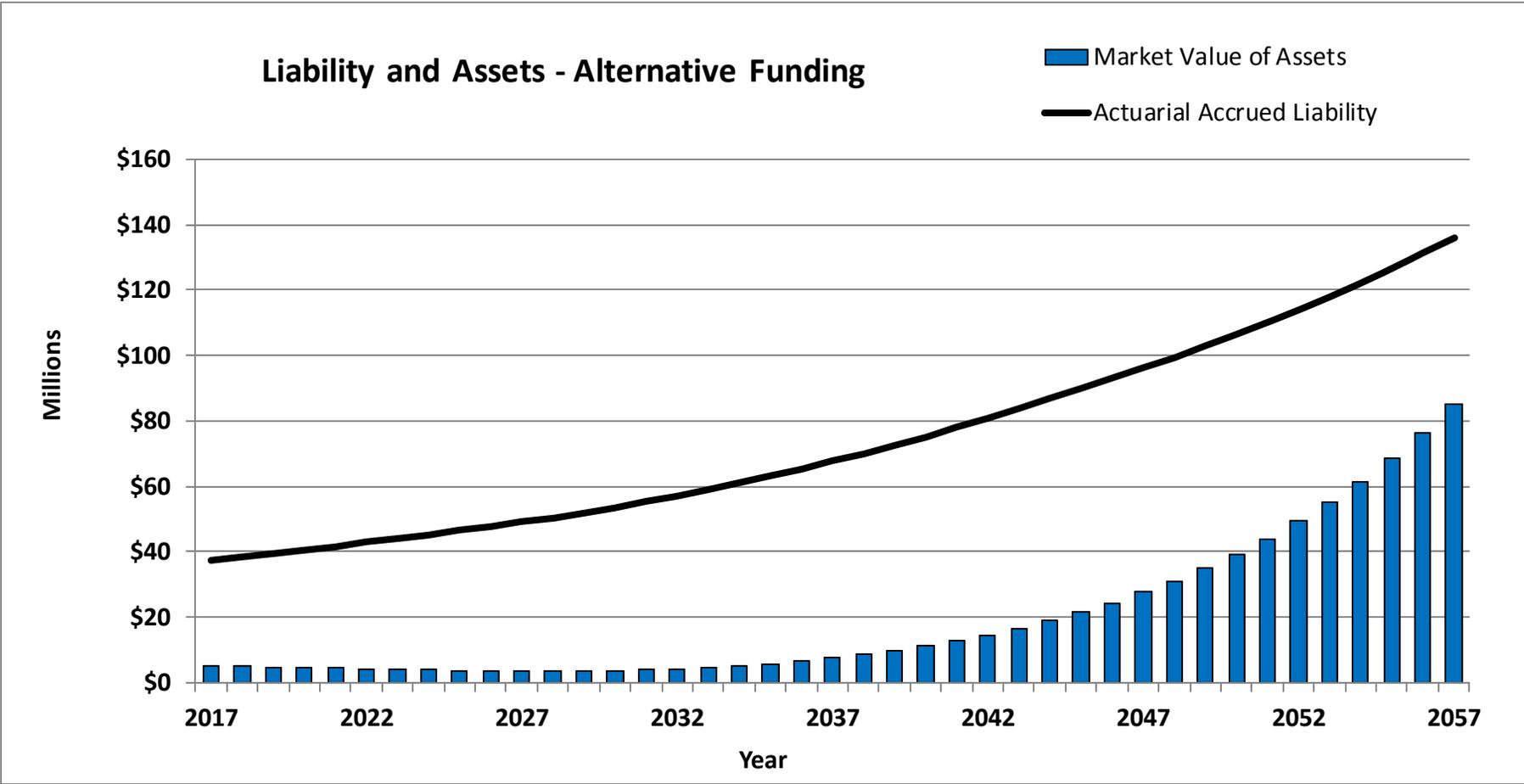
## Alternative Funding on an Open Group Basis, Table 1(c) (with Recommended Contributions starting in PYE 2019)

Valuation Plan Year End 30-Jun	Number		Total Assets										Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
	Active	Pay Status	Total Payroll	Assets (boy)	Benefit Payments	Employer Contributions	Member Contributions	Premium Tax Allocation Contributions	Investment Income	Assets (eoy)	Expenses				
2017	37	48	\$1,740,164	\$4,028,172	\$1,519,854	\$2,074	\$1,574,527	\$175,462	\$380,767	\$433,148	\$5,070,148	\$37,130,231	\$32,060,083	14%	
2018	37	49	1,907,577	5,070,148	1,538,685	2,131	604,944	174,745	399,687	195,648	4,904,356	38,223,463	33,319,107	13%	
2019	37	50	1,978,694	4,904,356	1,567,403	2,223	725,218	182,676	390,069	190,794	4,823,487	39,367,523	34,544,036	12%	
2020	37	51	2,041,400	4,823,487	1,626,878	2,308	775,983	189,053	408,400	187,874	4,755,612	40,529,124	35,773,512	12%	
2021	37	53	2,094,311	4,755,612	1,704,821	2,402	830,302	194,670	420,811	185,047	4,679,220	41,681,753	37,002,533	11%	
2022	37	53	2,181,750	4,679,220	1,771,323	2,508	888,423	203,617	434,505	182,271	4,614,205	42,857,138	38,242,933	11%	
2023	37	55	2,229,446	4,614,205	1,851,318	2,596	950,613	208,602	446,478	179,653	4,545,636	44,017,032	39,471,396	10%	
2024	37	56	2,320,228	4,545,636	1,934,820	2,716	1,017,156	218,295	462,273	177,076	4,482,900	45,181,725	40,698,825	10%	
2025	37	56	2,425,405	4,482,900	1,988,463	2,809	1,088,357	228,619	475,267	175,375	4,459,245	46,394,317	41,935,072	10%	
2026	37	56	2,540,648	4,459,245	2,028,722	2,894	1,164,542	239,940	487,505	175,605	4,495,220	47,678,082	43,182,862	9%	
2027	37	56	2,663,970	4,495,220	2,059,622	2,973	1,246,060	251,976	499,354	178,518	4,608,533	49,051,768	44,443,235	9%	
2028	37	56	2,758,970	4,608,533	2,108,118	3,047	1,333,284	261,496	511,121	184,237	4,787,506	50,484,362	45,696,856	9%	
2029	37	56	2,887,345	4,787,506	2,160,330	3,147	1,426,614	274,658	526,071	192,765	5,044,137	51,993,663	46,949,526	10%	
2030	37	56	3,008,518	5,044,137	2,206,797	3,231	1,526,477	286,698	539,004	204,580	5,390,867	53,585,567	48,194,700	10%	
2031	37	56	3,134,508	5,390,867	2,254,958	3,321	1,633,330	299,464	552,820	220,136	5,838,338	55,265,211	49,426,873	11%	
2032	37	56	3,265,698	5,838,338	2,300,606	3,409	1,747,663	312,694	566,737	239,932	6,401,348	57,042,001	50,640,653	11%	
2033	37	55	3,420,798	6,401,348	2,337,419	3,499	1,869,999	328,202	581,605	264,745	7,104,981	58,943,859	51,838,878	12%	
2034	37	55	3,588,451	7,104,981	2,356,779	3,579	2,000,899	344,699	595,263	295,695	7,981,179	61,001,401	53,020,222	13%	
2035	37	55	3,700,721	7,981,179	2,416,518	3,656	2,140,962	356,161	609,541	332,842	9,000,512	63,147,232	54,146,720	14%	
2036	37	55	3,823,840	9,000,512	2,509,139	3,768	2,290,829	369,370	628,370	375,382	10,151,556	65,357,900	55,206,344	16%	
2037	37	55	3,973,390	10,151,556	2,588,960	3,880	2,451,187	383,534	647,165	423,669	11,464,271	67,666,213	56,201,942	17%	
2038	37	55	4,119,107	11,464,271	2,660,813	3,982	2,622,770	396,079	665,727	478,766	12,962,819	70,078,298	57,115,479	18%	
2039	37	55	4,269,909	12,962,819	2,724,717	4,090	2,806,364	409,389	685,146	541,724	14,676,635	72,598,822	57,922,187	20%	
2040	37	55	4,409,741	14,676,635	2,803,682	4,201	3,002,809	421,078	705,282	613,232	16,611,153	75,210,920	58,599,767	22%	
2041	37	55	4,567,347	16,611,153	2,884,282	4,326	3,213,006	434,745	727,239	693,882	18,791,418	77,922,226	59,130,808	24%	
2042	37	56	4,729,750	18,791,418	2,961,073	4,445	3,437,916	448,705	748,860	784,728	21,246,109	80,742,422	59,496,313	26%	
2043	37	56	4,889,266	21,246,109	3,052,543	4,569	3,678,570	461,904	770,886	886,566	23,986,922	83,661,404	59,674,482	29%	
2044	37	56	5,047,510	23,986,922	3,154,497	4,700	3,936,070	475,627	794,117	1,000,008	27,033,547	86,665,882	59,632,335	31%	
2045	37	56	5,204,895	27,033,547	3,276,854	4,836	4,211,595	489,472	817,842	1,125,648	30,396,414	89,743,562	59,347,148	34%	
2046	37	56	5,363,831	30,396,414	3,411,827	4,975	4,506,407	503,834	842,165	1,264,091	34,096,109	92,888,328	58,792,219	37%	
2047	37	56	5,544,996	34,096,109	3,543,252	5,116	4,821,855	520,493	866,945	1,416,541	38,173,575	96,122,908	57,949,333	40%	
2048	37	56	5,725,722	38,173,575	3,678,030	5,251	5,159,385	536,928	891,155	1,584,457	42,662,219	99,451,651	56,789,432	43%	
2049	37	56	5,921,270	42,662,219	3,815,838	5,393	5,520,542	555,485	916,287	1,769,288	47,602,591	102,883,145	55,280,554	46%	
2050	37	55	6,131,977	47,602,591	3,949,608	5,531	5,906,980	575,461	941,315	1,972,795	53,044,003	106,438,461	53,394,458	50%	
2051	37	55	6,354,830	53,044,003	4,082,181	5,671	6,320,469	596,901	966,504	2,196,936	59,036,962	110,131,261	51,094,299	54%	
2052	37	55	6,592,011	59,036,962	4,214,945	5,811	6,762,902	620,100	992,032	2,443,749	65,634,989	113,977,354	48,342,365	58%	
2053	37	55	6,843,986	65,634,989	4,347,792	5,952	7,236,305	644,772	1,017,868	2,715,412	72,895,602	117,993,324	45,097,722	62%	
2054	37	54	7,110,961	72,895,602	4,479,395	6,094	7,742,846	670,375	1,044,017	3,014,285	80,881,636	122,196,158	41,314,522	66%	
2055	37	54	7,386,722	80,881,636	4,610,712	6,237	8,284,845	696,255	1,070,697	3,342,897	89,659,381	126,597,006	36,937,625	71%	
2056	37	54	7,673,365	89,659,381	4,743,706	6,387	8,864,784	723,566	1,098,557	3,703,947	99,300,141	131,203,016	31,902,875	76%	
2057	37	53	7,974,965	99,300,141	4,883,461	6,544	9,485,319	752,221	1,127,630	4,100,239	109,875,545	136,025,525	26,149,980	81%	

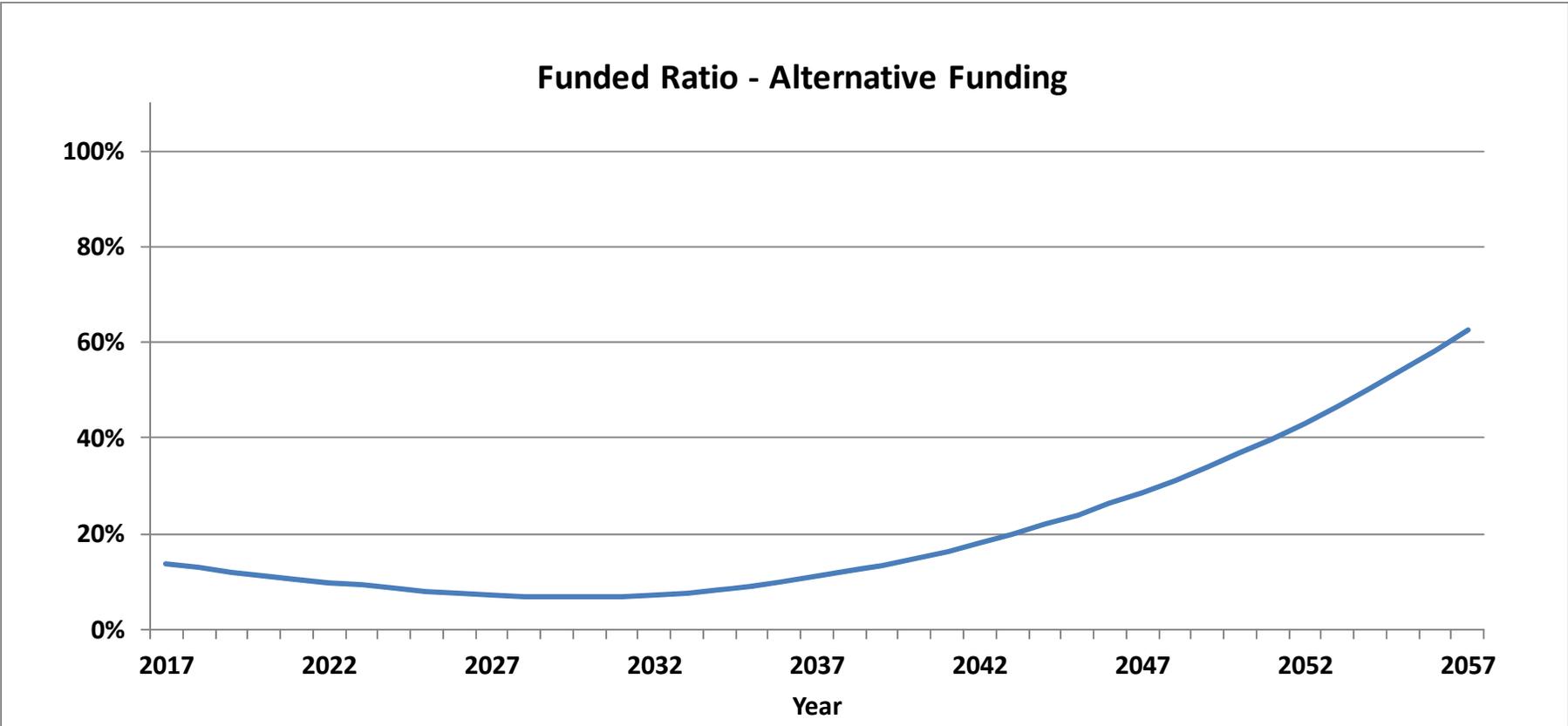
# Alternative Funding on an Closed Group Basis, Table 1(d) (with Recommended Contributions starting in PYE 2019)

Valuation Plan Year End 30-Jun	Number		Total Payroll	Total Assets								Assets (eoy)	Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
	Active	Pay Status		Assets (boj)	Benefit Payments	Expenses	Employer Contributions	Member Contributions	Premium Tax Allocation Contributions	Investment Income	Assets (eoy)				
2017	37	48	\$1,740,164	\$4,028,172	\$1,519,854	\$2,074	\$1,574,527	\$175,462	\$380,767	\$433,148	\$5,070,148	\$37,130,231	\$32,060,083	14%	
2018	34	49	1,907,577	5,070,148	1,538,685	2,131	604,944	174,745	399,687	195,648	4,904,356	38,223,463	33,319,107	13%	
2019	31	50	1,858,501	4,904,356	1,567,403	2,141	725,218	170,316	390,069	190,551	4,810,966	39,296,483	34,485,517	12%	
2020	29	51	1,800,750	4,810,966	1,626,447	2,154	775,983	165,095	365,848	186,068	4,675,359	40,313,634	35,638,275	12%	
2021	26	53	1,718,772	4,675,359	1,703,169	2,172	830,302	157,707	357,909	179,896	4,495,833	41,237,335	36,741,502	11%	
2022	24	53	1,649,833	4,495,833	1,767,861	2,192	888,423	151,510	349,073	172,287	4,287,074	42,083,658	37,796,584	10%	
2023	21	55	1,563,581	4,287,074	1,845,406	2,214	950,613	143,769	344,421	163,387	4,041,644	42,823,978	38,782,334	9%	
2024	19	56	1,470,443	4,041,644	1,925,985	2,238	1,017,156	135,421	335,826	152,955	3,754,780	43,445,811	39,691,031	9%	
2025	18	56	1,422,924	3,754,780	1,976,075	2,261	1,088,357	131,191	332,115	141,741	3,469,848	44,006,367	40,536,519	8%	
2026	16	56	1,395,328	3,469,848	2,012,117	2,285	1,164,542	128,761	330,105	131,051	3,209,905	44,530,749	41,320,844	7%	
2027	16	55	1,384,627	3,209,905	2,038,370	2,310	1,246,060	127,858	329,888	121,725	2,994,756	45,038,974	42,044,218	7%	
2028	14	56	1,349,627	2,994,756	2,081,803	2,334	1,333,284	124,776	330,818	113,943	2,813,440	45,498,381	42,684,941	6%	
2029	13	56	1,304,056	2,813,440	2,128,649	2,359	1,426,614	120,749	329,225	107,499	2,666,519	45,896,899	43,230,380	6%	
2030	12	56	1,268,637	2,666,519	2,169,164	2,384	1,526,477	117,644	329,467	102,740	2,571,298	46,245,634	43,674,336	6%	
2031	11	55	1,225,127	2,571,298	2,210,809	2,409	1,633,330	113,821	329,689	100,151	2,535,072	46,537,133	44,002,061	5%	
2032	10	55	1,183,611	2,535,072	2,249,518	2,433	1,747,663	110,189	330,460	100,142	2,571,575	46,773,672	44,202,097	5%	
2033	9	55	1,157,135	2,571,575	2,278,739	2,458	1,869,999	107,917	331,924	103,430	2,703,648	46,972,438	44,268,790	6%	
2034	9	54	1,153,870	2,703,648	2,289,808	2,482	2,000,899	107,738	334,418	111,132	2,965,544	47,164,360	44,198,816	6%	
2035	8	54	1,095,372	2,965,544	2,340,746	2,505	2,140,962	102,433	337,951	123,337	3,326,975	47,276,183	43,949,208	7%	
2036	6	54	977,937	3,326,975	2,423,927	2,526	2,290,829	91,649	338,235	138,907	3,760,141	47,237,070	43,476,929	8%	
2037	5	54	874,932	3,760,141	2,493,428	2,547	2,451,187	82,214	338,704	157,855	4,294,126	47,065,068	42,770,942	9%	
2038	5	54	784,129	4,294,126	2,553,777	2,567	2,622,770	73,877	340,560	181,288	4,956,277	46,772,626	41,816,349	11%	
2039	4	53	701,205	4,956,277	2,600,819	2,584	2,806,364	66,178	342,456	210,363	5,778,236	46,372,363	40,594,127	12%	
2040	3	53	609,739	5,778,236	2,649,111	2,598	3,002,809	57,615	344,408	246,044	6,777,403	45,853,526	39,076,123	15%	
2041	3	52	525,762	6,777,403	2,686,845	2,609	3,213,006	49,733	345,790	289,297	7,985,776	45,226,517	37,240,741	18%	
2042	2	51	463,069	7,985,776	2,704,814	2,616	3,437,916	43,848	347,741	341,653	9,449,503	44,519,565	35,070,062	21%	
2043	2	50	399,737	9,449,503	2,721,424	2,620	3,678,570	37,879	349,352	404,552	11,195,812	43,731,334	32,535,522	26%	
2044	1	49	337,156	11,195,812	2,734,336	2,620	3,936,070	31,966	350,788	479,159	13,256,839	42,863,628	29,606,789	31%	
2045	1	48	270,307	13,256,839	2,747,320	2,616	4,211,595	25,642	351,664	566,693	15,662,496	41,911,919	26,249,423	37%	
2046	1	46	203,160	15,662,496	2,756,526	2,608	4,506,407	19,284	352,044	668,456	18,449,553	40,877,673	22,428,120	45%	
2047	1	45	153,175	18,449,553	2,746,748	2,597	4,821,855	14,547	352,090	786,286	21,674,987	39,786,167	18,111,180	54%	
2048	0	44	111,957	21,674,987	2,728,003	2,581	5,159,385	10,636	351,807	922,277	25,388,508	38,649,727	13,261,219	66%	
2049	0	42	75,285	25,388,508	2,703,287	2,561	5,520,542	7,152	351,106	1,078,377	29,639,837	37,475,359	7,835,522	79%	
2050	0	41	51,918	29,639,837	2,664,056	2,538	5,906,980	4,932	349,901	1,256,793	34,491,849	36,282,459	1,790,610	95%	
2051	0	39	35,404	34,491,849	2,618,142	2,512	1,493,487	3,363	348,245	1,364,315	35,080,606	35,080,606	0	100%	
2052	0	38	23,966	35,080,606	2,567,372	2,482	11,299	2,277	0	1,352,600	33,876,927	33,876,927	0	100%	
2053	0	36	15,422	33,876,927	2,513,806	2,451	8,023	1,465	0	1,305,433	32,675,592	32,675,592	0	100%	
2054	0	35	9,496	32,675,592	2,457,903	2,416	5,765	902	0	1,258,432	31,480,372	31,480,372	0	100%	
2055	0	33	5,286	31,480,372	2,400,557	2,380	4,198	502	0	1,211,720	30,293,855	30,293,855	0	100%	
2056	0	32	2,572	30,293,855	2,342,142	2,343	3,189	244	0	1,165,392	29,118,196	29,118,196	0	100%	
2057	0	31	1,304	29,118,196	2,282,841	2,304	2,712	124	0	1,119,529	27,955,417	27,955,417	0	100%	

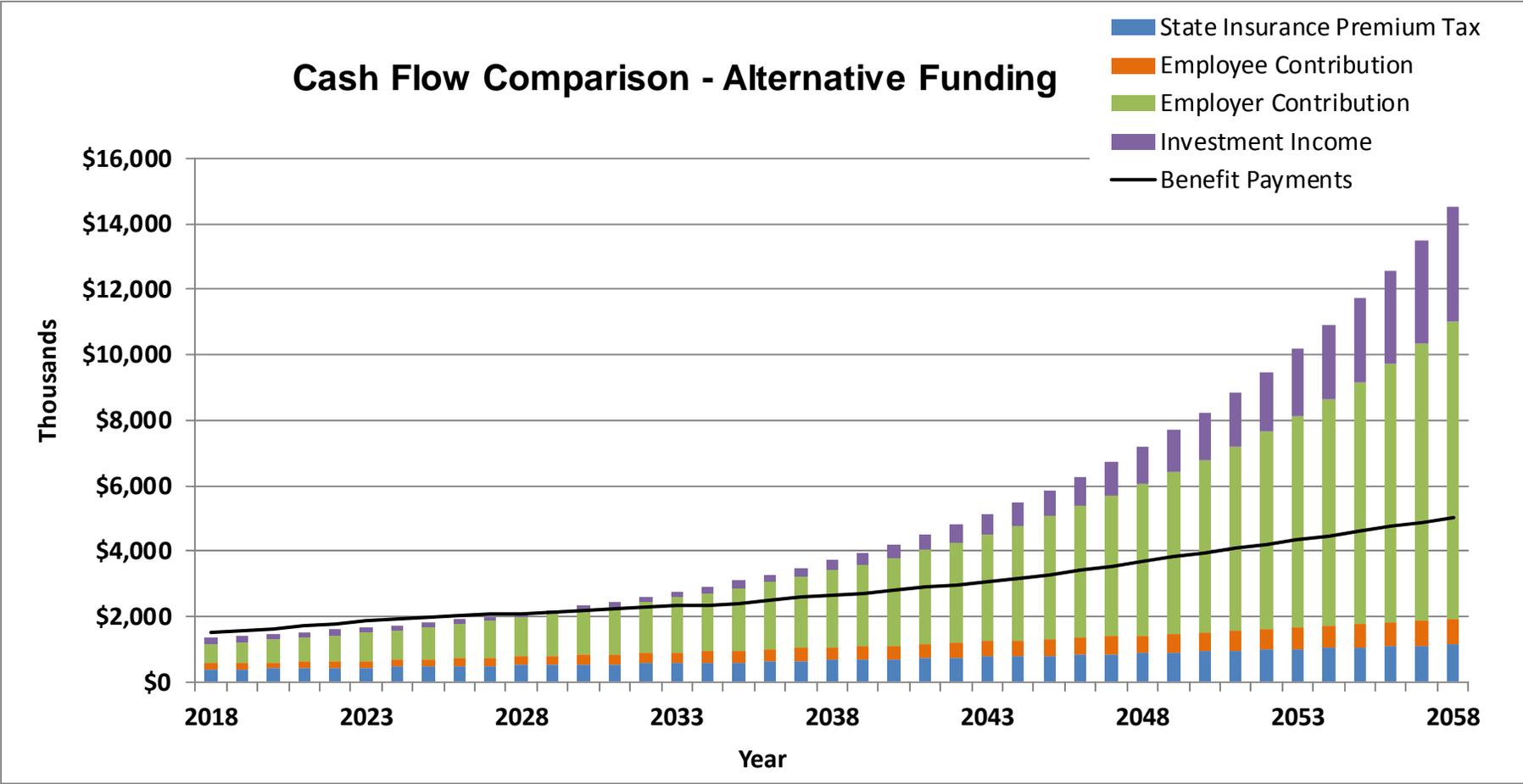
# Open Group Actuarial Projections – Alternative Funding, Graph 2 (with No Additional Contributions)



# Open Group Actuarial Projections – Alternative Funding, Graph 3 (with No Additional Contributions)



# Open Group Actuarial Projections – Alternative Funding, Graph 4 (with No Additional Contributions)



**SECTION III**

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**FUNDING POLICY CHOICES**

# Actuarial Projections –Alternative/Optional/Conservation Funding

## Funding Policy Choices

West Virginia Code §8-22-20 allows a municipality's governing body (City Council) the choice of changing from the Alternative funding policy to either the Optional funding policy or the Conservation funding policy. The Optional funding policy is defined in West Virginia Code §8-22-20(e)(1), and is effective for plan years beginning after January 1, 2010. The Conservation funding policy is defined in West Virginia Code §8-22-20(f)(1), and is effective for plan years beginning after April 1, 2011.

If the City Council elects either the Optional funding policy or the Conservation funding policy, the existing local Plan is closed, and new employees are covered in the multiple employer statewide plan - *Municipal Police Officers and Firefighters Retirement System*. Contributions to the statewide plan include:

- Employer contributions from 8.5% to 10.5% of pay. Currently, Employers contribute 8.5% of pay.
- Employee contributions of 8.5% of pay.

If the City Council elects the Optional funding policy, contributions to the closed local Plan include:

- Employer contributions equal to the normal cost, net of employee contributions, plus a 40-year closed period amortization from January 1, 2010, on a level dollar basis, of the unfunded actuarial accrued liability net of premium tax allocation applicable to the plan year.
- Employee contributions of 7% of pay if hired before January 1, 2010, which may be increased by up to 2.5% of pay if elected by the Board of trustees of the Plan. Employees hired after January 1, 2010, contribute 9.50% of pay.
- The premium tax allocation assigned to the Fund for the plan year.

If the City Council elects the Conservation funding policy, contributions to the closed local Plan are made to two asset accounts as follows:

- The first asset account (Benefit Payment Account) is used to finance benefits and expenses for the fiscal year on a pay-as-you-go basis. Sources to pay current year benefits and expenses include active member employee contributions in excess of 1.5% of pay, a portion of the premium tax allocation not assigned to the accumulation account as defined below, and employer contributions.
- The second account (Accumulation Account) cannot be used to pay benefits and expenses until assets exceed actuarial accrued liabilities. Contributions to the accumulation account include employee contributions of 1.5% of pay and a percentage of the premium tax allocation. The percentage of premium tax allocation is based on the amounts needed to produce 100% funding of liabilities in 35 years, from adoption, considering assets from both the benefit payment account and the accumulation account. This account also includes the Fund's assets prior to the adoption of Conservation funding policy.

## Actuarial Projections –Alternative/Optional/Conservation Funding (Continued)

For purposes of evaluating the implication of selecting either the Optional funding policy or the Conservation funding policy, we have generated actuarial projections under the following two illustrative scenarios.

- Scenario I – The sponsor elects either the Optional funding policy or Conservation funding policy during fiscal year end June 30, 2019, and makes the newly elected contribution in fiscal year end June 30, 2019.
- Scenario II – The sponsor elects either the Optional funding policy or the Conservation funding policy at some future date when/if contributions are projected to be less than under the current Alternative funding policy.

It is important to note that the plan sponsor can make only one election to either the Optional funding policy or the Conservation funding policy, and that the election is irrevocable. The projections assume employer contributions of 10.5% of pay for future members covered under the statewide plan.

Given that the funded ratio as of June 30, 2017 is only 14% and is projected to decline to 7% at June 30, 2026, and that the ratio of assets to expected benefits for the year is only 3.30, we strongly recommend that the sponsor make additional contributions in excess of the statutory minimum under either the Alternative or Conservation funding policies.

### **Scenario I – Sponsor Immediately Elects either the Optional or Conservation Funding Policy**

The following table shows the employer contribution for the fiscal year end June 30, 2019, if the sponsor elects either the Optional or Conservation funding policy in fiscal year end June 30, 2019:

<b>Total Employer Contributions for FYE June 30, 2019</b>				
	<b>Local Plan</b>		<b>Statewide Plan</b>	
<b>Funding Method</b>	<b>Amount</b>	<b>Percent of Pay</b>	<b>Amount</b>	<b>Percent of Pay</b>
Alternative	\$647,290	32.7%	NA	NA
Optional	\$2,336,451	125.7%	\$12,620	10.5%
Conservation	\$1,168,437	62.9%	\$12,620	10.5%

Graphs I(1), I(2), and I(3) on the following pages show the projected contribution and funded ratio pattern of the three separate funding policies. If the sponsor continues to make contributions under the Alternative policy, employer contributions are projected to increase from \$604,944 in fiscal year end 2018 to \$8,466,093 in fiscal year end 2057. In fiscal year end 2057, the plan is projected to be 63% funded.

If the Optional funding policy is selected in fiscal year end 2019, employer contributions to the local plan for fiscal year end 2019 are projected to increase from \$647,290 to \$2,336,451. However, over the 40-year projection period, total employer contributions to both the local plan and the statewide plan are projected to decrease from \$2,349,071 in fiscal year end 2019 to \$1,467,790 in fiscal year end 2049, and the Plan is projected to be fully funded in 2050.

# Actuarial Projections –Alternative/Optional/Conservation Funding (Continued)

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If the Conservation funding policy is selected in fiscal year end 2019, employer contributions to the local plan for fiscal year end 2019 are projected to increase from \$647,290 to \$1,168,437. During the 35-year projection period, total employer contributions to both the local plan and the statewide plan are projected to increase from \$1,181,058 in fiscal year end 2019 to \$2,640,439 in fiscal year end 2051 and the Plan is projected to be fully funded in 2052.

The Optional funding policy is consistent with actuarial standards of practice and produces a relatively stable dollar contribution pattern and reasonable growth in the funded ratio.

The Conservation funding policy produces a less stable contribution pattern and significantly slower growth in the funded ratio when compared to the Optional funding policy. The projections of employer contributions under the Conservation funding policy are dependent on the expected number of retirements, disabilities, and resulting benefit payments. Actual experience could produce a significantly higher number of retirements, disabilities, and benefit payments, which would increase the employer's required contribution under the Conservation funding policy. Unlike the Optional funding policy, the Conservation funding policy does not have a built-in feature to smooth out emerging gains and losses.

The Alternative funding policy produces a significantly lower funded ratio when compared to either the Optional funding policy or the Conservation funding policy, and the 7% annual increases in employer contributions may eventually be cost prohibitive.

The details of the Optional and Conservation funding policy projections can be found in the Appendix. The details of the Alternative funding policy projection were presented in Section II.

## **Scenario II – Sponsor Elects Optional or Conservation Policy if/when Contributions are Lower**

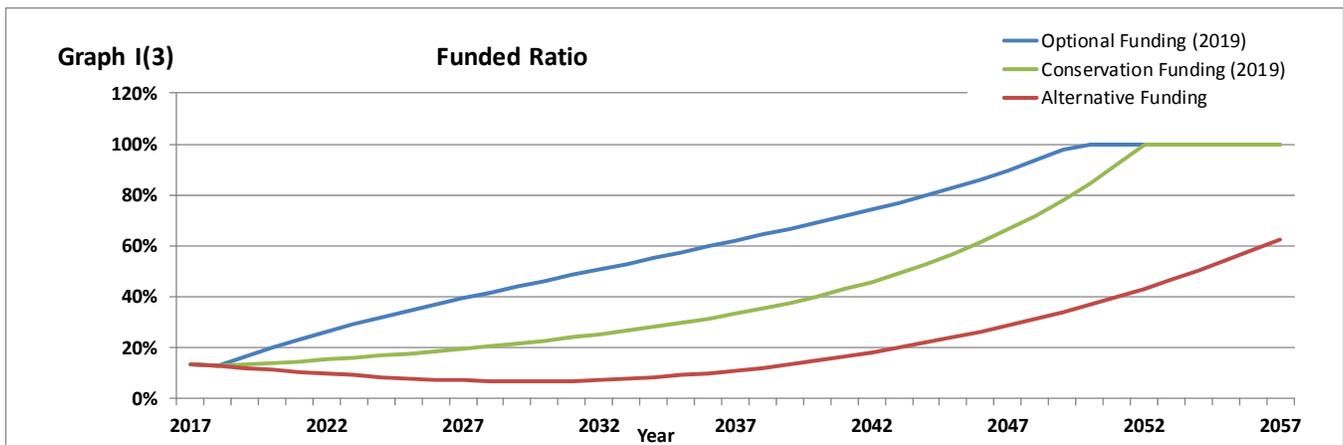
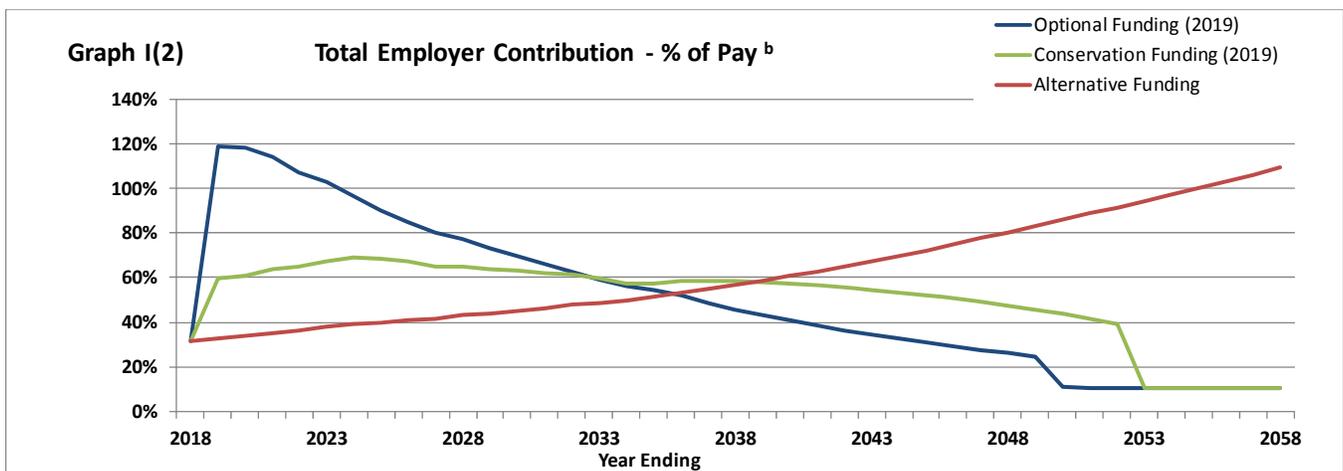
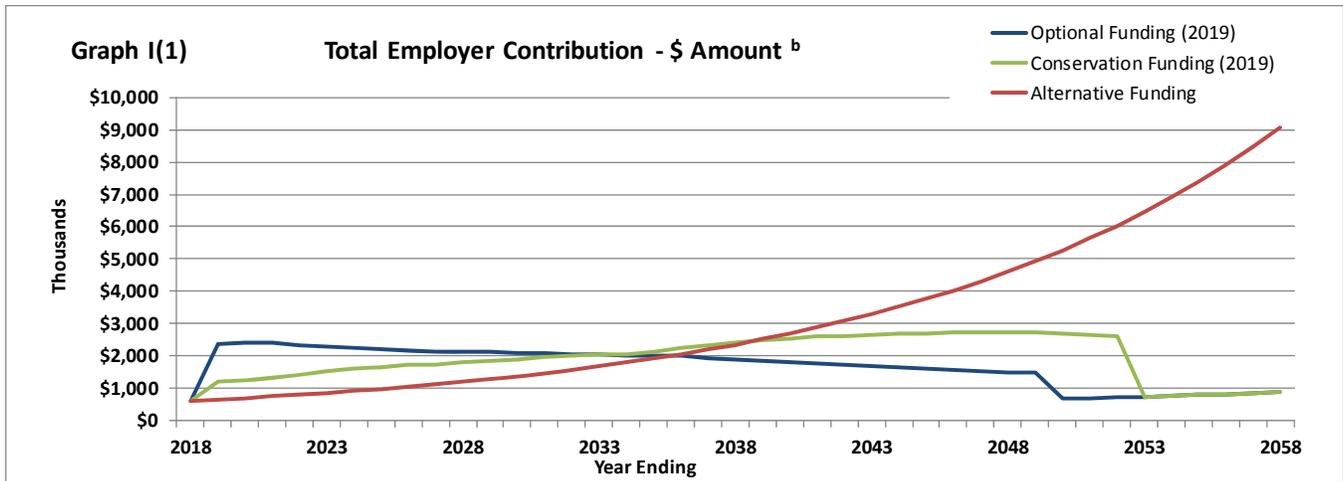
Under Scenario II, the plan sponsor is assumed to make contributions under the Alternative funding policy in future years, until the first year that either the Optional or Conservation policy produces a lower contribution. Under this assumption, the employer contributions under the Optional funding policy are not projected to be lower than contributions under the Alternative funding policy. In plan year end 2035, the employer contributions under the Conservation funding policy of \$1,898,211 are projected to be lower than contributions under the Alternative funding policy of \$1,910,908.

Graphs II(1), II(2), and III(3) show the projected contribution pattern and funded ratio. Based on these projections, the Conservation funding policy has lower projected employer contributions than the Alternative funding policy beginning in 2035. After 2035, the funded ratio under the Conservation funding policy increases at a lower rate than the Alternative funding policy. As stated above, however, the Conservation funding policy is dependent on expected benefits payments when considering the *expected number of retirement and disabilities*. The ultimate employer contributions depend on the *actual number of retirement and disabilities*, which could result in a more volatile contribution pattern when compared to the Optional funding policy.

The details of the Scenario II projections can be found in the Appendix.

# Actuarial Projections –Alternative/Optional/Conservation Funding<sup>a</sup> (Continued)

## Scenario I

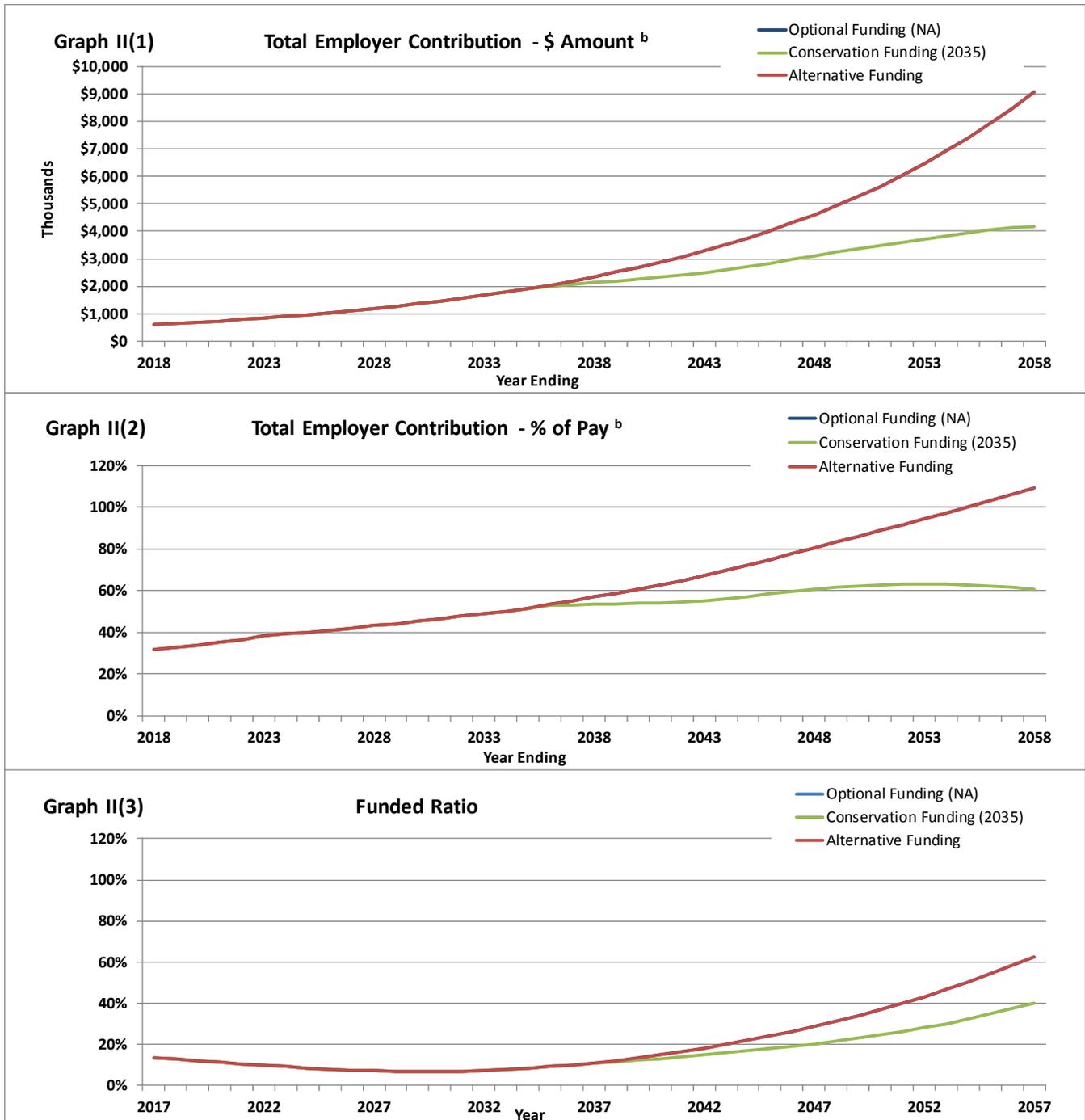


<sup>a</sup> Assumes Sponsor elects either the Optional funding policy or Conservation funding policy in fiscal year end June 30, 2019, and makes the newly elected contribution in fiscal year end June 30, 2019.

<sup>b</sup> Based on total pay and includes contributions for future members projected to participate in the statewide plan.

# Actuarial Projections –Alternative/Optional/Conservation Funding<sup>a</sup> (Continued)

## Scenario II



<sup>a</sup> Assumes Sponsor elects either the Optional funding policy or Conservation funding policy in the first year that contributions are lower than under the Alternative funding policy.

<sup>b</sup> Based on total pay and includes contributions for future members projected to participate in the statewide plan.

## **SECTION IV**

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### **ACTUARIALLY DETERMINED CONTRIBUTION FOR GASB STATEMENT NOS. 67 AND 68 REPORTING**

# Actuarially Determined Contribution for GASB Statement Nos. 67 and 68 Reporting

## Schedule C: Funding Progress and Employer Contributions

Valuation Date	July 1, 2016	July 1, 2017
Valuation Interest Rate	4.00%	4.00%
Cost-of-Living Adjustment	2.75%	2.75%
Wage Inflation	3.75%	3.75%
Actuarial Value of Assets	Market	Market
Actuarial Cost Method	Entry Age Normal	Entry Age Normal
Remaining Amortization Period <sup>a</sup>	24 Years, Level % of Pay	23 Years, Level % of Pay
<b>Schedule of Funding Progress</b>		
Actuarial Valuation Date	July 1, 2016	July 1, 2017
1. Market Value of Assets	\$4,028,173	\$5,070,148
2. Actuarial Accrued Liability	\$36,597,110	\$37,130,231
3. Unfunded Actuarial Accrued Liability (2 - 1)	\$32,568,937	\$32,060,083
4. Funded Ratio (1/2)	11%	14%
5. Expected Payroll	\$1,740,164	\$1,907,577
6. UAAL as Percentage of Covered Payroll (3/5)	1,872%	1,681%
<b>Schedule of Employer Contributions <sup>c</sup></b>		
1. Actuarially Determined Contribution	FYE 2017	FYE 2018
(a) Employer Normal Cost	\$903,957	\$981,150
(b) Amortization of Unfunded Actuarial Accrued Liability	\$1,394,930	\$1,431,130
(c) Actuarially Determined Contribution (ADC) (a + b)	\$2,298,887	\$2,412,280
2. Employer Contribution <sup>b</sup>	\$1,574,527	\$604,944
3. Premium Tax Allocation	\$380,767	\$399,687
4. Percentage of ADC Contributed [ (2 + 3)/1(c)]	85%	42%

<sup>a</sup> Suggested amortization policy to comply with GASB Statement Nos. 67 and 68 Standards.

<sup>b</sup> Estimated employer contribution for fiscal year end June 30, 2018.

<sup>c</sup> The Alternative minimum contribution plus the premium tax allocation does not satisfy the Actuarially Determined Contribution as defined by GASB Statement Nos. 67 and 68.

## **SECTION V**

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### **ACTUARIAL VALUATION DATA AS OF JULY 1, 2017**

## Actuarial Valuation Data as of July 1, 2017

### Schedule D: Reconciliation of Assets

Plan Year Ending	June 30, 2016	June 30, 2017
A. Market Value of Assets End of Prior Year	\$4,464,863	\$4,028,173
Adjustment to Market Value of Assets at Beginning of Year	\$0	(\$1)
Market Value of Assets Beginning of Year	\$4,464,863	\$4,028,172
1. Revenue During Fiscal Year		
(a) Employee Contribution	\$163,095	\$175,462
(b) Governmental Contribution		
(i) From Local Government	\$626,941	\$1,574,527
(ii) From State Government	\$345,588	\$380,767
(iii) Reallocation from State Government	\$0	\$0
(iv) Total	\$972,529	\$1,955,294
(c) Earnings on Investments		
(i) Net Appreciation/(Depreciation)	(\$204,719)	\$194,793
(ii) Bond Interest	\$50,174	\$42,107
(iii) Dividends	\$58,378	\$57,770
(iv) Net Realized Gain (Loss) on Sale/Exchange	\$68,014	\$156,748
(v) Other	(\$255)	\$0
(vi) Less Investment Expense	(\$17,732)	(\$18,270)
(vii) Total	(\$46,140)	\$433,148
(d) Other Revenue	\$0	\$0
(e) Receivable Investment Income/(Expense)	\$0	\$0
(f) Receivable Contribution <sup>a</sup>		
(i) From Employee Contributions	\$0	\$0
(ii) From Local Government	\$0	\$0
(iii) From State Government	\$0	\$0
(iv) Total	\$0	\$0
(g) Total Revenue (sum of (a) through (f))	\$1,089,484	\$2,563,904
2. Expenditures During Fiscal Year		
(a) Benefits Paid	\$1,498,119	\$1,519,854
(b) Withdrawals	\$27,917	\$0
(c) Administrative Expenses	\$138	\$2,074
(d) Payable Benefits and Withdrawals	\$0	\$0
(e) Payable Administrative Expenses	\$0	\$0
(f) Total Expenditures (sum of (a) through (e))	\$1,526,174	\$1,521,928
B. Market Value of Assets End of Year		
[A + 1(g) - 2(f)]	\$4,028,173	\$5,070,148
C. Approximate Return on Assets	(1.08)%	9.95%

<sup>a</sup> Receivable contributions for each respective plan year ending.

# Actuarial Valuation Data as of July 1, 2017

## Schedule E: Assets Held by Category

Plan Year Ending	June 30, 2016		June 30, 2017	
1. Cash and Short-term Investments	\$137,546	3%	\$330,313	7%
2. Government Securities				
(a) US Treasury Bills, Notes and Bonds	\$0		\$75,170	
(b) US State and Local Governmental Debt Securities	\$103,271		\$100,803	
(c) Foreign Governmental Debt Securities	\$0		\$0	
(d) Other	\$0		\$0	
(e) Total Government Securities (sum of (a) through (d) )	\$103,271	3%	\$175,973	3%
3. Corporate Fixed Income				
(a) US Bonds	\$904,315		\$652,494	
(b) US Mortgage or other Asset Backed Securities	\$0		\$0	
(c) US Mutual Fund Shares (Bonds)	\$174,834		\$329,496	
(d) US Exchange Traded Funds (Bonds)	\$355,846		\$669,891	
(e) International Bonds	\$0		\$0	
(f) International Mutual Fund Shares (Bonds)	\$0		\$0	
(g) International Exchange Traded Funds (Bonds)	\$0		\$0	
(h) Total Corporate Fixed Income (sum of (a) through (g) )	\$1,434,995	36%	\$1,651,881	33%
4. Corporate Equity				
(a) US Equity	\$1,644,135		\$1,922,285	
(b) US Mutual Fund Shares (Equity)	\$0		\$0	
(c) US Exchange Traded Funds (Equity)	\$396,311		\$467,383	
(d) International Equity	\$0		\$0	
(e) International Mutual Fund Shares (Equity)	\$0		\$0	
(f) International Exchange Traded Funds (Equity)	\$311,915		\$364,990	
(g) Total Corporate Equity (sum of (a) through (f) )	\$2,352,361	58%	\$2,754,658	54%
5. Alternative Investments				
(a) Real Estate Investment Trust	\$0		\$0	
(b) Private Equity Fund	\$0		\$0	
(c) Hedge Funds	\$0		\$0	
(d) Other Alternative Investments	\$0		\$157,323	
(e) Total Alternative Investments (sum of (a) through (d) )	\$0	0%	\$157,323	3%
6. Other	\$0	0%	\$0	0%
7. Receivable Contributions				
(a) From Employee Contributions	\$0		\$0	
(b) From Local Government	\$0		\$0	
(c) From State Government	\$0		\$0	
(d) Total Receivable Contributions (sum of (a) through (c) )	\$0	0%	\$0	0%
8. Accruals				
(a) Receivable (other than State and Local Contributions)	\$0		\$0	
(b) Less Payable	\$0		\$0	
(c) Total	\$0	0%	\$0	0%
<b>Market Value of Assets End of Year</b>	<b>\$4,028,173</b>		<b>\$5,070,148</b>	
<b>[ sum of (1) through (8) ]</b>				

## Actuarial Valuation Data as of July 1, 2017

### Schedule F: Summary of Participant Activity

	Actives	Retirees	Disabled	Deferred Vested	Spouses and Beneficiaries	Totals
<b>Total Participants July 1, 2016:</b>	<b>34</b>	<b>39</b>	<b>2</b>	<b>0</b>	<b>9</b>	<b>84</b>
New Actives:	4					4
Returned to Actives Status:						0
Data Corrections/Other Changes:						0
Vested Terminations:						0
Non-Vested Terminations:	(1)					(1)
Disabled:						0
Retirements:						0
Deaths with Beneficiary:		(2)			2	0
Deaths w/o Beneficiary:		(1)			(1)	(2)
Expired Annuity or Stop Payment:						0
Net Changes:	3	(3)	0	0	1	1
<b>Total Participants June 30, 2017:</b>	<b>37</b>	<b>36</b>	<b>2</b>	<b>0</b>	<b>10</b>	<b>85</b>

## Actuarial Valuation Data as of July 1, 2017

### Schedule G: Distribution of Active Employees by Age and Length of Service

Attained Age	Years of Service to Valuation Date									Totals	Valuation Payroll <sup>a</sup>
	Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	Over 35		
Under 20	1									1	\$ 48,010
20-24	1	3								4	\$ 184,983
25-29	1	3	1							5	\$ 229,306
30-34			5	1						6	\$ 300,368
35-39		1	1	3	1					6	\$ 311,958
40-44			1		1					2	\$ 109,754
45-49				3	4	2				9	\$ 514,508
50-54					4					4	\$ 234,854
55-59											\$ 0
60-64											\$ 0
65-69											\$ 0
Over 70											\$ 0
<b>Totals</b>	<b>3</b>	<b>7</b>	<b>8</b>	<b>7</b>	<b>10</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>37</b>	<b>\$ 1,933,741</b>
<b>Averages</b> _____											
Age: 37.5 years											
Service: 10.3 years											
Annual Pay: \$52,263 <sup>a</sup>											

<sup>a</sup> Based on payroll at beginning of plan year.

## Actuarial Valuation Data as of July 1, 2017

### Schedule H: Participants Summary

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Active Participants	July 1, 2016	July 1, 2017
Number of Actives	34	37
Total Annual Pay	\$1,715,048	\$1,933,741
Average Age	37.8	37.5
Average Service	10.2	10.3

Inactive Participants	July 1, 2016		July 1, 2017 <sup>a</sup>	
Type	No.	Annual Benefit	No.	Annual Benefit
Retirees	39	\$1,315,661	36	\$1,274,089
Survivors	9	\$134,447	10	\$147,945
Disabled Members	2	\$34,482	2	\$34,851
Deferred Vested Members	0	\$0	0	\$0

<sup>a</sup>Data provided includes 4 non-vested members with accumulated contributions balances of \$29,471.

**SECTION VI**

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**ACTUARIAL ASSUMPTIONS AND METHODS**

## Actuarial Assumptions and Methods Used in the Valuation as of July 1, 2017

### Discount Rate

The following table outlines the factors used to determine the discount rate:

Funded Ratio as of Valuation Date <sup>1</sup>	Liquidity Ratio <sup>2</sup>	Equity Exposure <sup>3</sup>	Projected Funded Ratio after 15 Years <sup>1</sup>	Discount Rate
60% or more	10	50% or more	70% or more	6.5%
40% or more	8	40% or more	60% or more	6.0%
30% or more	6	30% or more	50% or more	5.5%
15% or more	4	n/a	40% or more	5.0%
Less than 15%	n/a	n/a	15% or more	4.5%
Less than 15%	n/a	n/a	Less than 15%	4.0%

<sup>1</sup>Funded ratios based on a 6.0% investment return assumption for plans using an actuarially sound policy (standard or optional) and a 5.5% investment return assumption for other plans (alternative or conservation).

<sup>2</sup>Liquidity ratio equals assets as of the actuarial valuation date divided by expected benefit payments for the year.

<sup>3</sup>Based on investment policy.

As of June 30, 2017	
Assets	\$5,070,148
Liabilities using a 5.50% discount rate	\$30,301,806
Funded Ratio	17%
Expected Benefit Payments	\$1,538,685
Liquidity Ratio	3.30
Equity Exposure	54%
Projected Funded Ratio after 15 years	12%

Discount Rate

4.00%

## Actuarial Assumptions and Methods Used in the Valuation as of July 1, 2017 (Continued)

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**The premium tax allocation is projected using the following methodology:**

- (1) The Base Allocation for all Pension and Relief Funds is a fixed amount equal to \$8,709,689 in all future years. This amount is allocated to each individual Pension and Relief Fund in proportion to the number of eligible members, which includes active members covered in either the Pension and Relief Fund or the statewide plan, Municipal Police Officers and Firefighters Retirement System (“MPFRS”).
- (2) The Excess Allocation is equal to the excess of the current year premium tax assigned to all Pension and Relief Funds over the total Base Allocation. This amount is allocated to each individual Pension and Relief Fund in proportion to the number of eligible active and retired members covered in either the Pension and Relief Fund or the MPFRS.
- (3) We have assumed all Pension and Relief Funds will make the minimum statutory contribution requirement and will receive 100% of both the Base Allocation and the Excess Allocation assigned to the individual plan. Consequently, the projections do not include any reallocation of Expired Premium Tax Allocation for plan years beginning on and after July 1, 2019.
- (4) The total available premium tax allocation, net of expenses, as of September 1, 2018, includes a Base Allocation of \$8,709,689, an Excess Allocation of \$9,570,473, and an Expired Premium Tax Allocation of \$237,031.
- (5) For the plan year ending June 30, 2018, all Pension and Relief Funds reported a total of 1,717 eligible active members and 2,165 eligible retired members. The City of Weirton Policemen’s Pension and Relief Fund reported 35 eligible active members and 49 eligible retired members, based on the average number of plan participants for the 12-month period ending June 30, 2018. The Fund is eligible to receive a premium tax allocation of \$390,069 for the fiscal year ending June 30, 2019.
- (6) The total premium tax allocation was assumed to increase by 2.75% in calendar years ending on and after 2019.

## Actuarial Assumptions and Methods Used in the Valuation as of July 1, 2017 (Continued)

General Inflation	2.75%																		
Expected Salary Increase	General Inflation: 2.75% <i>plus</i>																		
Service-based Increase:	Wage Inflation Increment: 1.00% <i>plus</i>																		
	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;"><u>Years of Service</u></th> <th style="text-align: center;"><u>Increase</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">20.00%</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">6.50%</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">3.50%</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">2.75%</td> </tr> <tr> <td style="text-align: center;">5-9</td> <td style="text-align: center;">2.50%</td> </tr> <tr> <td style="text-align: center;">10-29</td> <td style="text-align: center;">2.00%</td> </tr> <tr> <td style="text-align: center;">30-34</td> <td style="text-align: center;">1.25%</td> </tr> <tr> <td style="text-align: center;">after 34 years of service</td> <td style="text-align: center;">0.00%</td> </tr> </tbody> </table>	<u>Years of Service</u>	<u>Increase</u>	1	20.00%	2	6.50%	3	3.50%	4	2.75%	5-9	2.50%	10-29	2.00%	30-34	1.25%	after 34 years of service	0.00%
<u>Years of Service</u>	<u>Increase</u>																		
1	20.00%																		
2	6.50%																		
3	3.50%																		
4	2.75%																		
5-9	2.50%																		
10-29	2.00%																		
30-34	1.25%																		
after 34 years of service	0.00%																		
Post-retirement COLA	2.75% on first \$15,000 of Annual Benefit and on the accumulated supplemental pension amounts for prior years. Assumed to be payable to all members receiving payments.																		
Increase in State Insurance Premium Tax Allocation	2.75% on and after year 1																		
Cost Method	Entry-Age-Normal, Level-Percentage-of-Pay																		
<i>Amortization Policies:</i>																			
Alternative Plans and former Alternative Plans that selected the Conservation Policy	For GASB 67/68 Accounting: 30 – Year Closed Level-Percentage-of-Pay Amortization (from July 1, 2010 – 23 years remaining as of July 1, 2017).																		
Standard Plans and former Standard Plans that selected the Optional Policy	For funding and GASB 67/68 Accounting: 40-Year Closed Level-Dollar Amortization (from July 1, 1991 – 14 years remaining as of July 1, 2017)																		
Former Alternative Plans that selected the Optional Policy	For funding: 40-Year Closed Level-Dollar Amortization (from January 1, 2010 – 32.5 years remaining as of July 1, 2017). For GASB 67/68 Accounting: 30-Year Closed Level-Percentage-of-Pay Amortization (from July 1, 2010 – 23 years remaining as of July 1, 2017)																		

## Actuarial Assumptions and Methods Used in the Valuation as of July 1, 2017 (Continued)

Asset Method	Market Value										
Turnover	<p>Sample Rates –</p> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;"><u>Age</u></th> <th style="text-align: center;"><u>Rates</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">25</td> <td style="text-align: center;">9%</td> </tr> <tr> <td style="text-align: center;">35</td> <td style="text-align: center;">4%</td> </tr> <tr> <td style="text-align: center;">45</td> <td style="text-align: center;">2%</td> </tr> <tr> <td style="text-align: center;">50</td> <td style="text-align: center;">0%</td> </tr> </tbody> </table>	<u>Age</u>	<u>Rates</u>	25	9%	35	4%	45	2%	50	0%
<u>Age</u>	<u>Rates</u>										
25	9%										
35	4%										
45	2%										
50	0%										
Retirement	<table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;"><u>Age</u></th> <th style="text-align: center;"><u>Rates<sup>a</sup></u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">50</td> <td style="text-align: center;">45%</td> </tr> <tr> <td style="text-align: center;">51-55</td> <td style="text-align: center;">30%</td> </tr> <tr> <td style="text-align: center;">56-59</td> <td style="text-align: center;">35%</td> </tr> <tr> <td style="text-align: center;">60</td> <td style="text-align: center;">100%</td> </tr> </tbody> </table> <p><sup>a</sup>Terminated vested participants are assumed to retire at age 50.</p>	<u>Age</u>	<u>Rates<sup>a</sup></u>	50	45%	51-55	30%	56-59	35%	60	100%
<u>Age</u>	<u>Rates<sup>a</sup></u>										
50	45%										
51-55	30%										
56-59	35%										
60	100%										
Mortality	<p>Active: RP-2014 Blue Collar Healthy Employee<sup>b</sup></p> <p>Post-Retirement: RP-2014 Blue Collar Healthy Annuitant</p> <p>Disabled: RP-2014 Blue Collar Healthy Annuitant set forward four years</p> <p>Tables above incorporate generational mortality improvement using MP-2014 2-dimensional mortality improvement scales</p> <p><sup>b</sup>Assumes 10% of deaths are duty-related and 90% are non-duty related.</p>										
Disability	<p>Sample Rates –</p> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;"><u>Age</u></th> <th style="text-align: center;"><u>Rates<sup>c</sup></u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">30</td> <td style="text-align: center;">0.22%</td> </tr> <tr> <td style="text-align: center;">40</td> <td style="text-align: center;">0.50%</td> </tr> <tr> <td style="text-align: center;">50</td> <td style="text-align: center;">0.79%</td> </tr> </tbody> </table> <p><sup>c</sup>Assumes 60% duty related and 40% non-duty related. Also assumes 10% of non-duty disabled members receive a 20% reduction in benefits due to gainful employment.</p>	<u>Age</u>	<u>Rates<sup>c</sup></u>	30	0.22%	40	0.50%	50	0.79%		
<u>Age</u>	<u>Rates<sup>c</sup></u>										
30	0.22%										
40	0.50%										
50	0.79%										
Percent Married	90%										
Spouse Age	Females 3 years younger than males										

## Actuarial Assumptions and Methods Used in the Valuation as of July 1, 2017 (Continued)

Administrative Expenses	Plan year end June 30, 2018, expense based on plan year end June 30, 2017 expense increased by general inflation assumption. Future expenses assumed to increase by the general inflation assumption.
Refunds Paid	Assumes non-vested inactive members as of July 1, 2017, with accumulated member contribution balances will receive a refund of their contributions during plan year end June 30, 2018.
Data Adjustments and Assumptions	None
Child Beneficiaries	Future survivor widow benefits are loaded by 12% to estimate impact of benefits provided to survivor children. The load assumes 90% of members are married with two children at time of death, and benefits for each child are paid for approximately 8 years.
General Projection Methodology	<p>Open group projections assume:</p> <ul style="list-style-type: none"> <li>(i) Salaries will increase and members will decrement as specified in the actuarial assumption section.</li> <li>(ii) Active members who retire, become disabled, die or terminate during the year are replaced with new entrants such that the number of active members remains stable during the projection period. Pay for new entrants in future years is increased by the wage inflation assumption. The average age of a new entrant is based on observed experience over the last five years.</li> <li>(iii) Assets grow at the assumed rate of return.</li> <li>(iv) The sponsor makes the statutory required contribution on a monthly basis.</li> <li>(v) Non-vested members with accumulated plan balances as of July 1, 2017, will receive a refund during plan year end June 30, 2018.</li> </ul> <p>Closed group projections are the same as the open group projections except active members who retire, become disabled, die, or terminate are <u>not</u> replaced with new entrants.</p>
Decrement Timing	Mid-Year

**SECTION VII**

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**SUMMARY OF PRINCIPAL PLAN PROVISIONS**

# Summary of Principal Plan Provisions

## Actuarial Valuation as of July 1, 2017

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**Employee Eligibility** — All compensated employees of the Police Department are eligible to participate in the Policemen's Pension and Relief Fund.

**Average Annual Compensation** — The average of any three twelve-consecutive-month periods of employment which produces the highest average annual compensation.

Each twelve-consecutive-month annual compensation is limited to 120% of the *Average Adjusted Salary* received by the member in the two consecutive twelve-consecutive-month periods immediately preceding the twelve-consecutive-month period used in determining benefits.

The *Average Adjusted Salary* is base salary (exclusive of all overtime and other pay) of the year used in determining benefits multiplied by the ratio of total salary (includes all overtime and other pay) to base salary from the respective preceding twelve-consecutive-month period.

**Determining Years of Service Credit (Credited Service)** — The number of years that the member has contributed to the employees retirement and benefit fund.

*Prior Military Service* — A city may provide that members who have been honorably discharged from the military shall receive up to two years prior service credit for military service prior to their employment with the city.

*Current Military Service* — Any current member who has been on qualified military service in the armed forces of the United States with an honorable discharge may, within six months from his or her date of discharge, be given credit for continuous service in the paid police or fire department.

Any member who has served in active duty with the armed forces of the United States, whether prior to or subsequent to becoming a member of a paid police or fire department, shall receive one additional percent for each year so served in active military duty, up to a maximum of four additional percent.

Absence from the service because of sickness or injury for a period of two years or less shall not be construed as time out of service.

**Contributions** — Participating employees contribute 9.0% of compensation. Participating employees hired on or after January 1, 2010 contribute 9.5% of compensation. The municipality has elected to contribute the minimum employer contribution under the Alternative funding policy.

**Normal Retirement** — Members are eligible at the earlier of age 50 with 20 years of credited service or age 65.

**Benefit Commencement** — Annual retirement pension benefits commence upon retirement or upon the member attaining age fifty, whichever is later, payable in twelve monthly installments.

## Summary of Principal Plan Provisions

### Actuarial Valuation as of July 1, 2017 (Continued)

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**Accrued Benefit** — The annual retirement benefit equals 60% of average annual compensation, not less than \$6,000, plus an additional percentage of average annual compensation for service over 20 years equal to 2% for each year of service between 20 and 25 and 1% for each year of service between 25 and 30 years. Employees serving in the military are eligible for an additional 1% of average annual compensation for each year of military service up to four years. The maximum benefit is limited to 75% of average annual compensation. Benefits continue for life.

**Disability Retirement** — Members are eligible after earning five years of service. No service requirement if disability is service related.

The monthly disability benefit equals the greater of 60% of monthly salary at disability or \$500. Employees serving in the military are eligible for an additional benefit of 1% of monthly salary at disability for each year of military service up to four years. Disability benefits, when aggregated with monthly state workers compensation benefits, shall not exceed 100% of the member's monthly compensation at the time of disability. Benefits continue for life or until recovery.

**Death Benefits** — Members are eligible after earning five years of service. No service requirement if death is service related. Retirees and terminated vested participants are also eligible.

The benefit is equal to 60% of the participant's benefit, but not less than \$300 per month, payable to the spouse until death or remarriage. Other dependents (children, parents, brothers and sisters) are also eligible for death benefits. To each dependent child, 20 percent of the participant's benefit until the child attains eighteen or marries; to each dependent orphaned child, 25 percent of the participant's benefit until the child attains 18 or marries; to each dependent parent, 10 percent of the participant's benefit for life, and to each dependent brother or sister, the sum of fifty dollars per month (but a total not to exceed \$100 per month) until such individual attains the age of eighteen years or marries.

In no case shall the payments to the surviving spouse and children be reduced below 65 percent of the total amount paid to all dependents.

**Supplemental Pension Benefits** — All retirees, surviving beneficiaries and disability pensioners are eligible for automatic cost-of-living benefits commencing on the first day of July following two years of retirement. The benefits equal the percentage increase in the Consumer Price Index, limited to 4% (2% for some disability retirees), multiplied by the sum of the allowable amount which is the first \$15,000 of the total annual benefits paid and the accumulated supplemental pension amounts for prior years.

**Termination Benefits** — Any member who terminates employment prior to retirement will be entitled to a refund of contributions without interest.

**Refunds** — Any member who terminates from their department without receiving a retirement pension shall be refunded all deductions made from his salary, without interest. Any member who receives such a refund and subsequently wishes to reenter the department must repay to the pension fund all sums refunded with interest at the rate of eight percent annual.

# SECTION VIII

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## APPENDIX – PROJECTION DATA

# Actuarial Projections – Optional Funding in 2019

## Table A-1

Valuation Plan	Total Assets												
	Number		Assets (bo)	Benefit Payments	Expenses	Employer Contribs.	Member Contribs.	Premium Tax		Assets (eoy)	Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
	Year End 30-Jun	Pay Active Status						Allocation Contribs.	Investment Income				
2017	37	48	\$4,028,172	\$1,519,854	\$2,074	\$1,574,527	\$175,462	\$380,767	\$433,148	\$5,070,148	\$37,130,231	\$32,060,083	14%
2018	34	49	5,070,148	1,538,685	2,131	604,944	174,745	399,687	195,648	4,904,356	38,223,463	33,319,107	13%
2019	31	50	4,904,356	1,567,403	2,141	2,336,451	170,316	390,069	222,460	6,454,108	39,296,483	32,842,375	16%
2020	29	51	6,454,108	1,626,447	2,154	2,386,218	165,095	408,400	284,526	8,069,746	40,313,634	32,243,888	20%
2021	26	53	8,069,746	1,703,169	2,172	2,345,148	157,707	420,811	346,917	9,634,989	41,237,335	31,602,346	23%
2022	24	53	9,634,989	1,767,861	2,192	2,282,592	151,510	434,505	407,155	11,140,699	42,083,658	30,942,959	26%
2023	21	55	11,140,699	1,845,406	2,214	2,226,300	143,769	446,478	464,816	12,574,442	42,823,978	30,249,536	29%
2024	19	56	12,574,442	1,925,985	2,238	2,155,987	135,421	462,273	519,325	13,919,226	43,445,811	29,526,585	32%
2025	18	56	13,919,226	1,976,075	2,261	2,083,364	131,191	475,267	570,859	15,201,571	44,006,367	28,804,796	35%
2026	16	56	15,201,571	2,012,117	2,285	2,037,134	128,761	487,505	620,717	16,461,286	44,530,749	28,069,463	37%
2027	16	55	16,461,286	2,038,370	2,310	2,004,226	127,858	499,354	670,151	17,722,195	45,038,974	27,316,779	39%
2028	14	56	17,722,195	2,081,803	2,334	1,981,892	124,776	511,121	719,456	18,975,303	45,498,381	26,523,078	42%
2029	13	56	18,975,303	2,128,649	2,359	1,944,845	120,749	526,071	768,135	20,204,095	45,896,899	25,692,804	44%
2030	12	56	20,204,095	2,169,164	2,384	1,903,573	117,644	539,004	815,861	21,408,628	46,245,634	24,837,006	46%
2031	11	55	21,408,628	2,210,809	2,409	1,866,916	113,821	552,820	862,689	22,591,656	46,537,133	23,945,477	49%
2032	10	55	22,591,656	2,249,518	2,433	1,826,907	110,189	566,737	908,655	23,752,192	46,773,672	23,021,480	51%
2033	9	55	23,752,192	2,278,739	2,458	1,787,111	107,917	581,605	953,958	24,901,586	46,972,438	22,070,852	53%
2034	9	54	24,901,586	2,289,808	2,482	1,756,637	107,738	595,263	999,378	26,068,311	47,164,360	21,096,049	55%
2035	8	54	26,068,311	2,340,746	2,505	1,737,757	102,433	609,541	1,044,841	27,219,632	47,276,183	20,056,551	58%
2036	6	54	27,219,632	2,423,927	2,526	1,688,616	91,649	628,370	1,088,432	28,290,246	47,237,070	18,946,824	60%
2037	5	54	28,290,246	2,493,428	2,547	1,608,687	82,214	647,165	1,128,482	29,260,819	47,065,068	17,804,249	62%
2038	5	54	29,260,819	2,553,777	2,567	1,534,342	73,877	665,727	1,164,840	30,143,262	46,772,626	16,629,364	64%
2039	4	53	30,143,262	2,600,819	2,584	1,466,554	66,178	685,146	1,198,096	30,955,833	46,372,363	15,416,530	67%
2040	3	53	30,955,833	2,649,111	2,598	1,401,559	57,615	705,282	1,228,584	31,697,165	45,853,526	14,156,361	69%
2041	3	52	31,697,165	2,686,845	2,609	1,330,584	49,733	727,239	1,256,362	32,371,630	45,226,517	12,854,887	72%
2042	2	51	32,371,630	2,704,814	2,616	1,262,580	43,848	748,860	1,281,950	33,001,438	44,519,565	11,518,127	74%
2043	2	50	33,001,438	2,721,424	2,620	1,204,063	37,879	770,886	1,305,973	33,596,195	43,731,334	10,135,139	77%
2044	1	49	33,596,195	2,734,336	2,620	1,145,733	31,966	794,117	1,328,695	34,159,750	42,863,628	8,703,878	80%
2045	1	48	34,159,750	2,747,320	2,616	1,087,553	25,642	817,842	1,350,172	34,691,023	41,911,919	7,220,896	83%
2046	1	46	34,691,023	2,756,526	2,608	1,027,119	19,284	842,165	1,370,400	35,190,857	40,877,673	5,686,816	86%
2047	1	45	35,190,857	2,746,748	2,597	965,332	14,547	866,945	1,389,761	35,678,097	39,786,167	4,108,070	90%
2048	0	44	35,678,097	2,728,003	2,581	908,975	10,636	891,155	1,408,908	36,167,187	38,649,727	2,482,540	94%
2049	0	42	36,167,187	2,703,287	2,561	853,962	7,152	916,287	1,428,300	36,667,040	37,475,359	808,319	98%
2050	0	41	36,667,040	2,664,056	2,538	811,158	4,932	932,158	1,430,731	36,282,459	36,282,459	0	100%
2051	0	39	36,282,459	2,618,142	2,512	776,661	3,363	950,025	1,399,776	35,080,606	35,080,606	0	100%
2052	0	38	35,080,606	2,567,372	2,482	740,299	2,277	967,026	1,352,600	33,876,927	33,876,927	0	100%
2053	0	36	33,876,927	2,513,806	2,451	708,023	1,465	978,548	1,305,433	32,675,592	32,675,592	0	100%
2054	0	35	32,675,592	2,457,903	2,416	676,765	902	985,670	1,258,432	31,480,371	31,480,371	0	100%
2055	0	33	31,480,371	2,400,557	2,380	648,198	502	990,700	1,211,720	30,293,855	30,293,855	0	100%
2056	0	32	30,293,855	2,342,142	2,343	624,189	244	994,244	1,165,392	29,118,196	29,118,196	0	100%
2057	0	31	29,118,196	2,282,841	2,304	608,712	124	995,588	1,119,529	27,955,416	27,955,417	0	100%

# Actuarial Projections – Optional Funding in 2019

## Table A-2

### Employer Contributions

Valuation Plan Year End 30-Jun <sup>a</sup>	Closed Group Payroll	New Entrant Payroll	Total Payroll	Employee Contributions	Gross Normal Cost	Net Employer Normal Cost	Amortization of UAAL	Premium Tax Allocation Contributions	Net Employer Amortization	Expenses	Optional Employer Contribution	Statewide Employer Contribution
2018	\$1,907,577	\$0	\$1,907,577	\$174,745	\$1,153,764	\$979,019	\$1,745,370	\$390,069	\$1,355,301	\$2,131	\$2,336,451	\$0
2019	1,858,501	120,193	1,978,694	170,316	1,120,288	949,972	1,842,505	408,400	1,434,105	2,141	2,386,218	12,620
2020	1,800,750	240,650	2,041,400	165,095	1,082,488	917,393	1,846,412	420,811	1,425,601	2,154	2,345,148	25,268
2021	1,718,772	375,538	2,094,311	157,707	1,027,891	870,184	1,844,741	434,505	1,410,236	2,172	2,282,592	39,432
2022	1,649,833	531,917	2,181,750	151,510	980,270	828,760	1,841,826	446,478	1,395,348	2,192	2,226,300	55,851
2023	1,563,581	665,865	2,229,446	143,769	920,674	776,905	1,839,141	462,273	1,376,868	2,214	2,155,987	69,916
2024	1,470,443	849,785	2,320,228	135,421	856,047	720,626	1,835,768	475,267	1,360,501	2,238	2,083,364	89,227
2025	1,422,924	1,002,481	2,425,405	131,191	821,574	690,383	1,831,995	487,505	1,344,490	2,261	2,037,134	105,261
2026	1,395,328	1,145,320	2,540,648	128,761	800,258	671,497	1,829,798	499,354	1,330,444	2,285	2,004,226	120,259
2027	1,384,627	1,279,343	2,663,970	127,858	790,163	662,305	1,828,399	511,121	1,317,278	2,310	1,981,892	134,331
2028	1,349,627	1,409,343	2,758,970	124,776	765,686	640,910	1,827,672	526,071	1,301,601	2,334	1,944,845	147,981
2029	1,304,056	1,583,289	2,887,345	120,749	734,844	614,095	1,826,123	539,004	1,287,119	2,359	1,903,573	166,245
2030	1,268,637	1,739,881	3,008,518	117,644	710,925	593,281	1,824,070	552,820	1,271,250	2,384	1,866,916	182,687
2031	1,225,127	1,909,381	3,134,508	113,821	682,696	568,875	1,822,360	566,737	1,255,623	2,409	1,826,907	200,485
2032	1,183,611	2,082,086	3,265,698	110,189	656,132	545,943	1,820,340	581,605	1,238,735	2,433	1,787,111	218,619
2033	1,157,135	2,263,662	3,420,798	107,917	639,027	531,110	1,818,332	595,263	1,223,069	2,458	1,756,637	237,685
2034	1,153,870	2,434,581	3,588,451	107,738	635,633	527,895	1,816,921	609,541	1,207,380	2,482	1,737,757	255,631
2035	1,095,372	2,605,348	3,700,721	102,433	600,401	497,968	1,816,513	628,370	1,188,143	2,505	1,688,616	273,562
2036	977,937	2,845,904	3,823,840	91,649	531,251	439,602	1,813,723	647,165	1,166,558	2,526	1,608,687	298,820
2037	874,932	3,098,459	3,973,390	82,214	471,961	389,747	1,807,775	665,727	1,142,048	2,547	1,534,342	325,338
2038	784,129	3,334,978	4,119,107	73,877	420,993	347,116	1,802,018	685,146	1,116,872	2,567	1,466,554	350,173
2039	701,205	3,568,705	4,269,909	66,178	373,750	307,572	1,796,686	705,282	1,091,404	2,584	1,401,559	374,714
2040	609,739	3,800,002	4,409,741	57,615	321,470	263,855	1,791,371	727,239	1,064,132	2,598	1,330,584	399,000
2041	525,762	4,041,585	4,567,347	49,733	273,496	223,763	1,785,069	748,860	1,036,209	2,609	1,262,580	424,366
2042	463,069	4,266,681	4,729,750	43,848	237,656	193,808	1,778,524	770,886	1,007,638	2,616	1,204,063	448,001
2043	399,737	4,489,528	4,889,266	37,879	202,314	164,435	1,772,796	794,117	978,679	2,620	1,145,733	471,400
2044	337,156	4,710,354	5,047,510	31,966	168,185	136,219	1,766,555	817,842	948,713	2,620	1,087,553	494,587
2045	270,307	4,934,588	5,204,895	25,642	132,856	107,214	1,759,454	842,165	917,289	2,616	1,027,119	518,132
2046	203,160	5,160,671	5,363,831	19,284	98,430	79,146	1,750,523	866,945	883,578	2,608	965,332	541,870
2047	153,175	5,391,822	5,544,996	14,547	73,093	58,546	1,738,987	891,155	847,832	2,597	908,975	566,141
2048	111,957	5,613,765	5,725,722	10,636	53,088	42,452	1,725,216	916,287	808,929	2,581	853,962	589,445
2049	75,285	5,845,984	5,921,270	7,152	35,749	28,597	1,704,297	815,191	762,982	2,561	811,158	<sup>b</sup> 613,828
2050	51,918	6,080,059	6,131,977	4,932	24,421	19,489	0	0	0	2,538	15,661	<sup>b</sup> 638,406
2051	35,404	6,319,425	6,354,830	3,363	16,509	13,146	0	0	0	2,512	11,299	<sup>b</sup> 663,540
2052	23,966	6,568,045	6,592,011	2,277	11,097	8,820	0	0	0	2,482	8,023	<sup>b</sup> 689,645
2053	15,422	6,828,563	6,843,986	1,465	7,036	5,571	0	0	0	2,451	5,765	<sup>b</sup> 716,999
2054	9,496	7,101,465	7,110,961	902	4,255	3,353	0	0	0	2,416	4,198	<sup>b</sup> 745,654
2055	5,286	7,381,436	7,386,722	502	2,316	1,814	0	0	0	2,380	3,189	<sup>b</sup> 775,051
2056	2,572	7,670,793	7,673,365	244	1,090	846	0	0	0	2,343	2,712	<sup>b</sup> 805,433
2057	1,304	7,973,661	7,974,965	124	534	410	0	0	0	2,304	2,431	<sup>b</sup> 837,234

<sup>a</sup> Assumes employer makes contributions for the applicable valuation plan year in the following fiscal year.

<sup>b</sup> Amount required to remain at 100% funded.

# Actuarial Projections – Conservation Funding in 2019

## Table A-3

Valuation			Total Assets										Actuarial		
Plan	Number		Assets	Benefit	Employer	Member	Premium Tax		Assets	Accrued	Unfunded	Funded			
	Year End	Pay					Allocation	Investment					Liability	Liability	Ratio
30-Jun	Active	Status	(boy)	Payments	Expenses	Contribs.	Contribs.	Income	(eoy)						
2017	37	48	\$4,028,172	\$1,519,854	\$2,074	\$1,574,527	\$175,462	\$380,767	\$433,148	\$5,070,148	\$37,130,231	\$32,060,083	14%		
2018	34	49	5,070,148	1,538,685	2,131	604,944	174,745	399,687	195,648	4,904,356	38,223,463	33,319,107	13%		
2019	31	50	4,904,356	1,567,403	2,141	1,168,437	170,316	390,069	199,329	5,262,964	39,296,483	34,033,519	13%		
2020	29	51	5,262,964	1,626,447	2,154	1,219,692	165,095	408,400	213,778	5,641,328	40,313,634	34,672,306	14%		
2021	26	53	5,641,328	1,703,169	2,172	1,294,361	157,707	420,811	228,971	6,037,837	41,237,335	35,199,498	15%		
2022	24	53	6,037,837	1,767,861	2,192	1,355,154	151,510	434,505	244,902	6,453,855	42,083,658	35,629,802	15%		
2023	21	55	6,453,855	1,845,406	2,214	1,431,230	143,769	446,478	261,597	6,889,309	42,823,978	35,934,670	16%		
2024	19	56	6,889,309	1,925,985	2,238	1,508,309	135,421	462,273	279,093	7,346,182	43,445,811	36,099,629	17%		
2025	18	56	7,346,182	1,976,075	2,261	1,553,323	131,191	475,267	297,441	7,825,067	44,006,367	36,181,300	18%		
2026	16	56	7,825,067	2,012,117	2,285	1,583,289	128,761	487,505	316,669	8,326,889	44,530,749	36,203,860	19%		
2027	16	55	8,326,889	2,038,370	2,310	1,602,452	127,858	499,354	336,818	8,852,691	45,038,974	36,186,284	20%		
2028	14	56	8,852,691	2,081,803	2,334	1,640,662	124,776	511,121	357,918	9,403,031	45,498,381	36,095,350	21%		
2029	13	56	9,403,031	2,128,649	2,359	1,680,963	120,749	526,071	380,018	9,979,825	45,896,899	35,917,075	22%		
2030	12	56	9,979,825	2,169,164	2,384	1,715,501	117,644	539,004	403,166	10,583,592	46,245,634	35,662,042	23%		
2031	11	55	10,583,592	2,210,809	2,409	1,751,179	113,821	552,820	427,395	11,215,589	46,537,133	35,321,545	24%		
2032	10	55	11,215,589	2,249,518	2,433	1,783,693	110,189	566,737	452,756	11,877,012	46,773,672	34,896,660	25%		
2033	9	55	11,877,012	2,278,739	2,458	1,804,954	107,917	581,605	479,304	12,569,595	46,972,438	34,402,843	27%		
2034	9	54	12,569,595	2,289,808	2,482	1,807,120	107,738	595,263	507,098	13,294,524	47,164,360	33,869,836	28%		
2035	8	54	13,294,524	2,340,746	2,505	1,853,040	102,433	609,541	536,173	14,052,461	47,276,183	33,223,722	30%		
2036	6	54	14,052,461	2,423,927	2,526	1,932,778	91,649	628,370	566,581	14,845,386	47,237,070	32,391,684	31%		
2037	5	54	14,845,386	2,493,428	2,547	1,997,727	82,214	647,165	598,393	15,674,910	47,065,068	31,390,158	33%		
2038	5	54	15,674,910	2,553,777	2,567	2,052,761	73,877	665,727	631,670	16,542,601	46,772,626	30,230,025	35%		
2039	4	53	16,542,601	2,600,819	2,584	2,093,398	66,178	685,146	666,483	17,450,404	46,372,363	28,921,959	38%		
2040	3	53	17,450,404	2,649,111	2,598	2,135,542	57,615	705,282	702,902	18,400,036	45,853,526	27,453,490	40%		
2041	3	52	18,400,036	2,686,845	2,609	2,165,349	49,733	727,239	741,009	19,393,912	45,226,517	25,832,605	43%		
2042	2	51	19,393,912	2,704,814	2,616	2,173,932	43,848	748,860	780,890	20,434,012	44,519,565	24,085,553	46%		
2043	2	50	20,434,012	2,721,424	2,620	2,180,959	37,879	770,886	822,622	21,522,314	43,731,334	22,209,021	49%		
2044	1	49	21,522,314	2,734,336	2,620	2,183,439	31,966	794,117	866,290	22,661,170	42,863,628	20,202,458	53%		
2045	1	48	22,661,170	2,747,320	2,616	2,186,009	25,642	817,842	911,983	23,852,710	41,911,919	18,059,209	57%		
2046	1	46	23,852,710	2,756,526	2,608	2,184,427	19,284	842,165	959,787	25,099,239	40,877,673	15,778,433	61%		
2047	1	45	25,099,239	2,746,748	2,597	2,162,194	14,547	866,945	1,009,799	26,403,379	39,786,167	13,382,788	66%		
2048	0	44	26,403,379	2,728,003	2,581	2,130,670	10,636	891,155	1,062,113	27,767,369	38,649,727	10,882,358	72%		
2049	0	42	27,767,369	2,703,287	2,561	2,092,202	7,152	916,287	1,116,830	29,193,992	37,475,359	8,281,366	78%		
2050	0	41	29,193,992	2,664,056	2,538	2,038,222	4,932	941,315	1,174,055	30,685,921	36,282,459	5,596,537	85%		
2051	0	39	30,685,921	2,618,142	2,512	1,976,899	3,363	966,504	1,233,895	32,245,928	35,080,606	2,834,678	92%		
2052	0	38	32,245,928	2,567,372	2,482	1,910,083	2,277	992,032	1,296,462	33,876,927	33,876,927	0	100%		
2053	0	36	33,876,927	2,513,806	2,451	8,023	1,465	0	1,305,433	32,675,592	32,675,592	0	100%		
2054	0	35	32,675,592	2,457,903	2,416	5,766	902	0	1,258,432	31,480,372	31,480,372	0	100%		
2055	0	33	31,480,372	2,400,557	2,380	4,198	502	0	1,211,720	30,293,855	30,293,855	0	100%		
2056	0	32	30,293,855	2,342,142	2,343	3,190	244	0	1,165,392	29,118,196	29,118,196	0	100%		
2057	0	31	29,118,196	2,282,841	2,304	2,712	124	0	1,119,529	27,955,416	27,955,417	0	100%		

# Actuarial Projections – Conservation Funding in 2019

## Table A-4

Plan Year End	Benefit Payment Account <sup>a</sup>							Accumulation Account <sup>b</sup>						Statewide Employer Contribution
	Assets (boy)	Net Benefit Pmts and Expenses	Employer Contribs.	7.66% <sup>d</sup> of Pay Member Contribs.	66.31% of Premium Tax Allocation	Investment Income	Transfer (To)/From Accumulation Account	Assets (boy) <sup>c</sup>	Net Benefit Pmts and Expenses	Employer Contribs.	1.50% of Pay Member Contribs.	33.69% of Premium Tax Allocation	Investment Income	
2018	\$5,070,148	\$1,540,816	\$604,944	\$174,745	\$399,687	\$195,648	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2019	4,904,356	1,569,544	1,168,437	142,438	258,669	196,174	(5,100,530)	5,100,530	0	0	27,878	131,400	3,154	12,620
2020	0	1,628,601	1,219,692	138,084	270,825	0	0	5,262,963	0	0	27,011	137,575	213,778	25,268
2021	0	1,705,341	1,294,361	131,925	279,055	0	0	5,641,327	0	0	25,782	141,756	228,971	39,432
2022	0	1,770,053	1,355,154	126,763	288,136	0	0	6,037,836	0	0	24,747	146,369	244,902	55,851
2023	0	1,847,620	1,431,230	120,315	296,075	0	0	6,453,854	0	0	23,454	150,402	261,597	69,916
2024	0	1,928,223	1,508,309	113,364	306,550	0	0	6,889,308	0	0	22,057	155,723	279,093	89,227
2025	0	1,978,336	1,553,323	109,847	315,166	0	0	7,346,181	0	0	21,344	160,100	297,441	105,261
2026	0	2,014,402	1,583,289	107,831	323,282	0	0	7,825,066	0	0	20,930	164,223	316,669	120,259
2027	0	2,040,680	1,602,452	107,089	331,139	0	0	8,326,888	0	0	20,769	168,214	336,818	134,331
2028	0	2,084,137	1,640,662	104,532	338,943	0	0	8,852,690	0	0	20,244	172,179	357,918	147,981
2029	0	2,131,008	1,680,963	101,188	348,857	0	0	9,403,030	0	0	19,561	177,214	380,018	166,245
2030	0	2,171,548	1,715,501	98,614	357,433	0	0	9,979,824	0	0	19,030	181,571	403,166	182,687
2031	0	2,213,218	1,751,179	95,444	366,595	0	0	10,583,591	0	0	18,377	186,225	427,395	200,485
2032	0	2,251,951	1,783,693	92,435	375,823	0	0	11,215,588	0	0	17,754	190,913	452,756	218,619
2033	0	2,281,197	1,804,954	90,560	385,683	0	0	11,877,011	0	0	17,357	195,922	479,304	237,685
2034	0	2,292,290	1,807,120	90,430	394,740	0	0	12,569,594	0	0	17,308	200,523	507,098	255,631
2035	0	2,343,251	1,853,040	86,002	404,209	0	0	13,294,523	0	0	16,431	205,333	536,173	273,562
2036	0	2,426,453	1,932,778	76,980	416,695	0	0	14,052,460	0	0	14,669	211,676	566,581	298,820
2037	0	2,495,975	1,997,727	69,090	429,158	0	0	14,845,385	0	0	13,124	218,007	598,393	325,338
2038	0	2,556,344	2,052,761	62,115	441,468	0	0	15,674,909	0	0	11,762	224,260	631,670	350,173
2039	0	2,603,403	2,093,398	55,660	454,345	0	0	16,542,600	0	0	10,518	230,801	666,483	374,714
2040	0	2,651,709	2,135,542	48,469	467,698	0	0	17,450,403	0	0	9,146	237,584	702,902	399,000
2041	0	2,689,454	2,165,349	41,847	482,258	0	0	18,400,035	0	0	7,886	244,981	741,009	424,366
2042	0	2,707,430	2,173,932	36,902	496,596	0	0	19,393,911	0	0	6,946	252,264	780,890	448,001
2043	0	2,724,044	2,180,959	31,883	511,202	0	0	20,434,011	0	0	5,996	259,684	822,622	471,400
2044	0	2,736,956	2,183,439	26,909	526,608	0	0	21,522,313	0	0	5,057	267,510	866,290	494,587
2045	0	2,749,936	2,186,009	21,587	542,340	0	0	22,661,169	0	0	4,055	275,502	911,983	518,132
2046	0	2,759,134	2,184,427	16,237	558,470	0	0	23,852,709	0	0	3,047	283,695	959,787	541,870
2047	0	2,749,345	2,162,194	12,249	574,902	0	0	25,099,238	0	0	2,298	292,043	1,009,799	566,141
2048	0	2,730,584	2,130,670	8,957	590,957	0	0	26,403,378	0	0	1,679	300,198	1,062,113	589,445
2049	0	2,705,848	2,092,202	6,023	607,623	0	0	27,767,368	0	0	1,129	308,664	1,116,830	613,828
2050	0	2,666,594	2,038,222	4,153	624,219	0	0	29,193,991	0	0	779	317,095	1,174,055	638,406
2051	0	2,620,654	1,976,899	2,832	640,923	0	0	30,685,920	0	0	531	325,581	1,233,895	663,540
2052	0	2,569,853	1,910,083	1,918	657,852	0	0	32,245,927	0	0	359	334,180	1,296,461	689,645
2053	0	0	0	0	0	0	0	33,876,927	2,516,257	8,023	1,465	0	1,305,433	716,999
2054	0	0	0	0	0	0	0	32,675,591	2,460,319	5,766	902	0	1,258,432	745,654
2055	0	0	0	0	0	0	0	31,480,372	2,402,937	4,198	502	0	1,211,720	775,051
2056	0	0	0	0	0	0	0	30,293,855	2,344,485	3,190	244	0	1,165,392	805,433
2057	0	0	0	0	0	0	0	29,118,196	2,285,145	2,712	124	0	1,119,529	837,234

<sup>a</sup> Employer contributions paid from the City's General Fund are used to finance benefits not covered by the applicable employee contributions or premium tax allocation.

<sup>b</sup> Assets accumulate in the Pension and Relief Fund.

<sup>c</sup> Includes transfer from Benefit Payment Account to Accumulation Account in Plan Year End June 30, 2035.

<sup>d</sup> Blended employee contribution rate of 9.16% of pay less 1.50% of pay going into the Accumulation Account.

# Actuarial Projections – Optional Funding in (N/A)

## Table A-5

Valuation Plan	Total Assets													
	Number		Assets							Premium Tax		Actuarial Liability	Unfunded Liability	Funded Ratio
	Year End 30-Jun	Pay	Assets (boy)	Benefit Payments	Expenses	Employer Contribs.	Member Contribs.	Allocation Contribs.	Investment Income	Assets (eoy)				
2017	37	48	\$4,028,172	\$1,519,854	\$2,074	\$1,574,527	\$175,462	\$380,767	\$433,148	\$5,070,148	\$37,130,231	\$32,060,083	14%	
2018	37	49	5,070,148	1,538,685	2,131	604,944	174,745	399,687	195,648	4,904,356	38,223,463	33,319,107	13%	
2019	37	50	4,904,356	1,567,403	2,223	647,290	182,676	390,069	189,251	4,744,016	39,367,523	34,623,507	12%	
2020	37	51	4,744,016	1,626,878	2,308	692,600	189,053	408,400	183,044	4,587,928	40,529,124	35,941,196	11%	
2021	37	53	4,587,928	1,704,821	2,402	741,082	194,670	420,811	176,572	4,413,841	41,681,753	37,267,912	11%	
2022	37	53	4,413,841	1,771,323	2,508	792,958	203,617	434,505	169,766	4,240,856	42,857,138	38,616,282	10%	
2023	37	55	4,240,856	1,851,318	2,596	848,465	208,602	446,478	162,696	4,053,182	44,017,032	39,963,850	9%	
2024	37	56	4,053,182	1,934,820	2,716	907,858	218,295	462,273	155,213	3,859,285	45,181,725	41,322,440	9%	
2025	37	56	3,859,285	1,988,463	2,809	971,408	228,619	475,267	148,114	3,691,420	46,394,317	42,702,897	8%	
2026	37	56	3,691,420	2,028,722	2,894	1,039,407	239,940	487,505	142,414	3,569,069	47,678,082	44,109,013	7%	
2027	37	56	3,569,069	2,059,622	2,973	1,112,165	251,976	499,354	138,820	3,508,789	49,051,768	45,542,979	7%	
2028	37	56	3,508,789	2,108,118	3,047	1,190,017	261,496	511,121	137,410	3,497,668	50,484,362	46,986,694	7%	
2029	37	56	3,497,668	2,160,330	3,147	1,273,318	274,658	526,071	138,135	3,546,373	51,993,663	48,447,290	7%	
2030	37	56	3,546,373	2,206,797	3,231	1,362,450	286,698	539,004	141,422	3,665,918	53,585,567	49,919,649	7%	
2031	37	56	3,665,918	2,254,958	3,321	1,457,822	299,464	552,820	147,663	3,865,408	55,265,211	51,399,803	7%	
2032	37	56	3,865,408	2,300,606	3,409	1,559,870	312,694	566,737	157,296	4,157,989	57,042,001	52,884,012	7%	
2033	37	55	4,157,989	2,337,419	3,499	1,669,061	328,202	581,605	171,031	4,566,970	58,943,859	54,376,889	8%	
2034	37	55	4,566,970	2,356,779	3,579	1,785,895	344,699	595,263	189,917	5,122,386	61,001,401	55,879,015	8%	
2035	37	55	5,122,386	2,416,518	3,656	1,910,908	356,161	609,541	213,934	5,792,757	63,147,232	57,354,475	9%	
2036	37	55	5,792,757	2,509,139	3,768	2,044,672	369,370	628,370	242,197	6,564,459	65,357,900	58,793,441	10%	
2037	37	55	6,564,459	2,588,960	3,880	2,187,799	383,534	647,165	274,969	7,465,086	67,666,213	60,201,127	11%	
2038	37	55	7,465,086	2,660,813	3,982	2,340,945	396,079	665,727	313,218	8,516,261	70,078,298	61,562,037	12%	
2039	37	55	8,516,261	2,724,717	4,090	2,504,811	409,389	685,146	357,890	9,744,690	72,598,822	62,854,132	13%	
2040	37	55	9,744,690	2,803,682	4,201	2,680,148	421,078	705,282	409,564	11,152,879	75,210,920	64,058,041	15%	
2041	37	55	11,152,879	2,884,282	4,326	2,867,758	434,745	727,239	468,714	12,762,728	77,922,226	65,159,498	16%	
2042	37	56	12,762,728	2,961,073	4,445	3,068,501	448,705	748,860	536,265	14,599,541	80,742,422	66,142,881	18%	
2043	37	56	14,599,541	3,052,543	4,569	3,283,296	461,904	770,886	612,875	16,671,389	83,661,404	66,990,015	20%	
2044	37	56	16,671,389	3,154,497	4,700	3,513,127	475,627	794,117	699,011	18,994,074	86,665,882	67,671,808	22%	
2045	37	56	18,994,074	3,276,854	4,836	3,759,046	489,472	817,842	795,107	21,573,851	89,743,562	68,169,711	24%	
2046	37	56	21,573,851	3,411,827	4,975	4,022,179	503,834	842,165	901,599	24,426,826	92,888,328	68,461,502	26%	
2047	37	56	24,426,826	3,543,252	5,116	4,303,732	520,493	866,945	1,019,509	27,589,137	96,122,908	68,533,771	29%	
2048	37	56	27,589,137	3,678,030	5,251	4,604,993	536,928	891,155	1,150,100	31,089,032	99,451,651	68,362,619	31%	
2049	37	56	31,089,032	3,815,838	5,393	4,927,343	555,485	916,287	1,294,613	34,961,530	102,883,145	67,921,615	34%	
2050	37	55	34,961,530	3,949,608	5,531	5,272,257	575,461	941,315	1,454,583	39,250,007	106,438,461	67,188,454	37%	
2051	37	55	39,250,007	4,082,181	5,671	5,641,315	596,901	966,504	1,631,726	43,998,602	110,131,261	66,132,659	40%	
2052	37	55	43,998,602	4,214,945	5,811	6,036,207	620,100	992,032	1,827,823	49,254,008	113,977,354	64,723,346	43%	
2053	37	55	49,254,008	4,347,792	5,952	6,458,741	644,772	1,017,868	2,044,774	55,066,419	117,993,324	62,926,905	47%	
2054	37	54	55,066,419	4,479,395	6,094	6,910,853	670,375	1,044,017	2,284,641	61,490,816	122,196,158	60,705,342	50%	
2055	37	54	61,490,816	4,610,712	6,237	7,394,613	696,255	1,070,697	2,549,634	68,585,066	126,597,006	58,011,940	54%	
2056	37	54	68,585,066	4,743,706	6,387	7,912,236	723,566	1,098,557	2,842,111	76,411,442	131,203,016	54,791,574	58%	
2057	37	53	76,411,442	4,883,461	6,544	8,466,093	752,221	1,127,630	3,164,507	85,031,888	136,025,525	50,993,637	63%	

# Actuarial Projections – Optional Funding in (N/A)

## Table A-6

Valuation Plan Year End 30-Jun <sup>a,b</sup>	Employer Contributions					Premium Tax			Minimum Payment			Statewide Employer Contribution
	Total Payroll	Employee Contributions	Gross Normal Cost	Net Employer Normal Cost	Amortization of UAAL	Allocation Contributions	Net Employer Amortization	Expenses	Optional Employer Contribution	Alternative Employer Contribution	Minimum Employer Contribution	
2018	\$1,907,577	\$174,745	\$1,153,764	\$979,019	\$1,745,370	\$390,069	\$1,355,301	\$2,131	\$2,336,451	\$647,290	\$647,290	\$0
2019	1,978,694	182,676	1,190,369	1,007,693	1,842,505	408,400	1,434,105	2,223	2,444,021	692,600	692,600	0
2020	2,041,400	189,053	1,222,988	1,033,934	1,946,548	420,811	1,525,737	2,308	2,561,979	741,082	741,082	0
2021	2,094,311	194,670	1,247,376	1,052,706	2,056,272	434,505	1,621,767	2,402	2,676,874	792,958	792,958	0
2022	2,181,750	203,617	1,291,420	1,087,804	2,172,023	446,478	1,725,545	2,508	2,815,857	848,465	848,465	0
2023	2,229,446	208,602	1,310,578	1,101,976	2,295,216	462,273	1,832,943	2,596	2,937,515	907,858	907,858	0
2024	2,320,228	218,295	1,353,953	1,135,658	2,425,305	475,267	1,950,038	2,716	3,088,413	971,408	971,408	0
2025	2,425,405	228,619	1,409,458	1,180,839	2,563,876	487,505	2,076,371	2,809	3,260,019	1,039,407	1,039,407	0
2026	2,540,648	239,940	1,472,486	1,232,547	2,712,662	499,354	2,213,308	2,894	3,448,749	1,112,165	1,112,165	0
2027	2,663,970	251,976	1,541,693	1,289,717	2,873,188	511,121	2,362,067	2,973	3,654,756	1,190,017	1,190,017	0
2028	2,758,970	261,496	1,594,252	1,332,756	3,047,125	526,071	2,521,054	3,047	3,856,857	1,273,318	1,273,318	0
2029	2,887,345	274,658	1,666,138	1,391,480	3,235,050	539,004	2,696,046	3,147	4,090,674	1,362,450	1,362,450	0
2030	3,008,518	286,698	1,734,960	1,448,263	3,439,534	552,820	2,886,714	3,231	4,338,208	1,457,822	1,457,822	0
2031	3,134,508	299,464	1,807,079	1,507,615	3,662,742	566,737	3,096,005	3,321	4,606,941	1,559,870	1,559,870	0
2032	3,265,698	312,694	1,882,816	1,570,122	3,907,424	581,605	3,325,819	3,409	4,899,350	1,669,061	1,669,061	0
2033	3,420,798	328,202	1,973,250	1,645,048	4,176,999	595,263	3,581,736	3,499	5,230,284	1,785,895	1,785,895	0
2034	3,588,451	344,699	2,071,251	1,726,552	4,476,425	609,541	3,866,886	3,579	5,597,015	1,910,908	1,910,908	0
2035	3,700,721	356,161	2,137,386	1,781,225	4,811,563	628,370	4,183,193	3,656	5,968,073	2,044,672	2,044,672	0
2036	3,823,840	369,370	2,210,360	1,840,990	5,186,592	647,165	4,539,427	3,768	6,384,186	2,187,799	2,187,799	0
2037	3,973,390	383,534	2,300,385	1,916,851	5,609,662	665,727	4,943,935	3,880	6,864,665	2,340,945	2,340,945	0
2038	4,119,107	396,079	2,388,848	1,992,769	6,093,126	685,146	5,407,980	3,982	7,404,731	2,504,811	2,504,811	0
2039	4,269,909	409,389	2,478,272	2,068,883	6,651,347	705,282	5,946,065	4,090	8,019,038	2,680,148	2,680,148	0
2040	4,409,741	421,078	2,560,339	2,139,261	7,303,531	727,239	6,576,292	4,201	8,719,754	2,867,758	2,867,758	0
2041	4,567,347	434,745	2,651,742	2,216,996	8,077,500	748,860	7,328,640	4,326	9,549,962	3,068,501	3,068,501	0
2042	4,729,750	448,705	2,744,991	2,296,286	9,015,069	770,886	8,244,183	4,445	10,544,915	3,283,296	3,283,296	0
2043	4,889,266	461,904	2,836,918	2,375,014	10,180,288	794,117	9,386,171	4,569	11,765,754	3,513,127	3,513,127	0
2044	5,047,510	475,627	2,928,519	2,452,893	11,676,361	817,842	10,858,519	4,700	13,316,112	3,759,046	3,759,046	0
2045	5,204,895	489,472	3,021,221	2,531,749	13,679,584	842,165	12,837,419	4,836	15,374,004	4,022,179	4,022,179	0
2046	5,363,831	503,834	3,116,686	2,612,851	16,526,018	866,945	15,659,073	4,975	18,276,899	4,303,732	4,303,732	0
2047	5,544,996	520,493	3,225,163	2,704,670	20,935,029	891,155	20,043,874	5,116	22,753,660	4,604,993	4,604,993	0
2048	5,725,722	536,928	3,334,397	2,797,468	28,781,287	916,287	27,865,000	5,251	30,667,720	4,927,343	4,927,343	0
2049	5,921,270	555,485	3,452,870	2,897,385	46,931,848	941,315	45,990,533	5,393	48,893,311	5,272,257	5,272,257	0
2050	6,131,977	575,461	3,578,961	3,003,500	69,266,705	966,504	68,300,201	5,531	70,489,722	5,641,315	5,641,315	0
2051	6,354,830	596,901	3,711,942	3,115,040	68,519,025	992,032	67,526,993	5,671	69,502,669	6,036,207	6,036,207	0
2052	6,592,011	620,100	3,853,061	3,232,961	67,442,321	1,017,868	66,424,453	5,811	68,163,648	6,458,741	6,458,741	0
2053	6,843,986	644,772	4,002,720	3,357,948	66,005,099	1,044,017	64,961,082	5,952	66,437,339	6,910,853	6,910,853	0
2054	7,110,961	670,375	4,161,202	3,490,826	64,173,082	1,070,697	63,102,385	6,094	64,280,001	7,394,613	7,394,613	0
2055	7,386,722	696,255	4,324,575	3,628,320	61,907,525	1,098,557	60,808,968	6,237	61,639,795	7,912,236	7,912,236	0
2056	7,673,365	723,566	4,493,784	3,770,218	59,160,783	1,127,630	58,033,153	6,387	58,469,468	8,466,093	8,466,093	0
2057	7,974,965	752,221	4,671,370	3,919,150	55,876,643	1,157,798	54,718,845	6,544	54,713,392	9,058,720	9,058,720	0

<sup>a</sup> Assumes sponsor selects Optional funding policy if contributions are lower.

<sup>b</sup> Assumes employer makes contributions for the applicable valuation plan year in the following fiscal year.

<sup>c</sup> Amount required to remain at 100% funded.

# Actuarial Projections – Conservation Funding in 2035

## Table A-7

Valuation Plan	Total Assets												Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
	Year End 30-Jun	Number		Assets (boy)	Benefit Payments	Expenses	Employer Contribs.	Member Contribs.	Premium Tax		Assets (eoy)				
		Active	Pay Status						Allocation Contribs.	Investment Income					
2017	37	48	\$4,028,172	\$1,519,854	\$2,074	\$1,574,527	\$175,462	\$380,767	\$433,148	\$5,070,148	\$37,130,231	\$32,060,083	14%		
2018	37	49	5,070,148	1,538,685	2,131	604,944	174,745	399,687	195,648	4,904,356	38,223,463	33,319,107	13%		
2019	37	50	4,904,356	1,567,403	2,223	647,290	182,676	390,069	189,251	4,744,016	39,367,523	34,623,507	12%		
2020	37	51	4,744,016	1,626,878	2,308	692,600	189,053	408,400	183,044	4,587,927	40,529,124	35,941,197	11%		
2021	37	53	4,587,927	1,704,821	2,402	741,082	194,670	420,811	176,573	4,413,840	41,681,753	37,267,913	11%		
2022	37	53	4,413,840	1,771,323	2,508	792,958	203,617	434,505	169,766	4,240,855	42,857,138	38,616,283	10%		
2023	37	55	4,240,855	1,851,318	2,596	848,465	208,602	446,478	162,696	4,053,182	44,017,032	39,963,850	9%		
2024	37	56	4,053,182	1,934,820	2,716	907,858	218,295	462,273	155,214	3,859,286	45,181,725	41,322,439	9%		
2025	37	56	3,859,286	1,988,463	2,809	971,408	228,619	475,267	148,114	3,691,422	46,394,317	42,702,895	8%		
2026	37	56	3,691,422	2,028,722	2,894	1,039,407	239,940	487,505	142,414	3,569,072	47,678,082	44,109,010	7%		
2027	37	56	3,569,072	2,059,622	2,973	1,112,165	251,976	499,354	138,820	3,508,792	49,051,768	45,542,976	7%		
2028	37	56	3,508,792	2,108,118	3,047	1,190,017	261,496	511,121	137,410	3,497,671	50,484,362	46,986,691	7%		
2029	37	56	3,497,671	2,160,330	3,147	1,273,318	274,658	526,071	138,136	3,546,377	51,993,663	48,447,286	7%		
2030	37	56	3,546,377	2,206,797	3,231	1,362,450	286,698	539,004	141,422	3,665,923	53,585,567	49,919,644	7%		
2031	37	56	3,665,923	2,254,958	3,321	1,457,822	299,464	552,820	147,663	3,865,413	55,265,211	51,399,798	7%		
2032	37	56	3,865,413	2,300,606	3,409	1,559,870	312,694	566,737	157,296	4,157,995	57,042,001	52,884,006	7%		
2033	37	55	4,157,995	2,337,419	3,499	1,669,061	328,202	581,605	171,032	4,566,977	58,943,859	54,376,882	8%		
2034	35	55	4,566,977	2,356,779	3,579	1,785,895	344,699	595,263	189,917	5,122,393	61,001,401	55,879,008	8%		
2035	33	55	5,122,393	2,416,518	3,590	1,898,211	344,744	609,541	213,459	5,768,240	63,081,616	57,313,376	9%		
2036	31	55	5,768,240	2,508,740	3,604	1,987,402	339,736	628,370	239,506	6,450,910	65,115,726	58,664,816	10%		
2037	29	55	6,450,910	2,587,174	3,622	2,062,374	335,460	647,165	267,031	7,172,144	67,128,411	59,956,267	11%		
2038	27	55	7,172,144	2,656,634	3,642	2,129,112	330,620	665,727	296,098	7,933,425	69,127,272	61,193,847	11%		
2039	26	55	7,933,425	2,717,373	3,662	2,187,516	324,924	685,146	326,775	8,736,750	71,103,971	62,367,221	12%		
2040	24	55	8,736,750	2,792,545	3,683	2,262,678	316,268	705,282	359,134	9,583,885	73,029,103	63,445,218	13%		
2041	22	55	9,583,885	2,868,599	3,704	2,339,114	306,311	727,239	393,265	10,477,511	74,886,093	64,408,582	14%		
2042	20	55	10,477,511	2,939,929	3,724	2,410,945	296,368	748,860	429,250	11,419,282	76,676,110	65,256,828	15%		
2043	19	55	11,419,282	3,024,949	3,744	2,498,640	283,776	770,886	467,161	12,411,052	78,371,678	65,960,626	16%		
2044	17	56	12,411,052	3,119,513	3,762	2,596,957	269,252	794,117	507,078	13,455,182	79,937,714	66,482,532	17%		
2045	15	56	13,455,182	3,233,472	3,779	2,716,356	252,476	817,842	549,088	14,553,693	81,339,763	66,786,070	18%		
2046	14	56	14,553,693	3,358,934	3,794	2,848,301	234,133	842,165	593,275	15,708,838	82,550,540	66,841,702	19%		
2047	12	55	15,708,838	3,479,668	3,807	2,975,158	215,990	866,945	639,733	16,923,189	83,570,746	66,647,557	20%		
2048	11	55	16,923,189	3,602,614	3,818	3,105,068	197,127	891,155	688,551	18,198,658	84,391,152	66,192,494	22%		
2049	9	55	18,198,658	3,727,319	3,827	3,236,827	177,646	916,287	739,821	19,538,093	84,994,129	65,456,036	23%		
2050	8	55	19,538,093	3,846,475	3,835	3,362,919	158,358	941,315	793,649	20,944,023	85,381,511	64,437,488	25%		
2051	7	54	20,944,023	3,963,017	3,842	3,486,489	138,848	966,504	850,138	22,419,142	85,544,780	63,125,638	26%		
2052	6	54	22,419,142	4,078,300	3,847	3,608,708	119,238	992,032	909,397	23,966,370	85,475,701	61,509,331	28%		
2053	4	53	23,966,370	4,192,039	3,851	3,728,439	100,406	1,017,868	971,544	25,588,737	85,166,207	59,577,470	30%		
2054	4	53	25,588,737	4,302,791	3,855	3,843,312	83,445	1,044,017	1,036,702	27,289,567	84,618,851	57,329,284	32%		
2055	3	52	27,289,567	4,407,553	3,858	3,950,709	68,049	1,070,697	1,105,011	29,072,622	83,851,734	54,779,112	35%		
2056	2	51	29,072,622	4,497,704	3,861	4,041,504	54,442	1,098,557	1,176,628	30,942,188	82,880,121	51,937,933	37%		
2057	2	50	30,942,188	4,574,886	3,862	4,117,411	42,573	1,127,630	1,251,726	32,902,780	81,723,224	48,820,444	40%		

# Actuarial Projections – Conservation Funding in 2035

## Table A-8

Plan Year End 30-Jun	Benefit Payment Account <sup>a</sup>						Accumulation Account <sup>b</sup>						Minimum Payment			Statewide Employer Contribution
	Assets (boy)	Net Benefit Pmts and Expenses	Employer Contribs.	7.66% <sup>a</sup> of Pay Member Contribs.	37.90% of Premium Tax Allocation	Investment Income	Assets (boy) <sup>c</sup>	Net Benefit Pmts and Expenses	Employer Contribs.	1.50% of Pay Member Contribs.	62.10% of Premium Tax Allocation	Investment Income	Conservation Employer Cont.	Alternative Employer Cont.	Minimum Alt /Cons Cont.	
2018	\$5,070,148	\$1,540,816	\$604,944	\$174,745	\$399,687	\$195,648	\$0	\$0	\$0	\$0	\$0	\$0	NA	\$604,944	\$604,944	\$0
2019	4,904,356	1,569,626	647,290	182,676	390,069	189,251	0	0	0	0	0	0	NA	647,290	647,290	0
2020	4,744,016	1,629,186	692,600	189,053	408,400	183,044	0	0	0	0	0	0	NA	692,600	692,600	0
2021	4,587,928	1,707,223	741,082	194,670	420,811	176,573	0	0	0	0	0	0	NA	741,082	741,082	0
2022	4,413,841	1,773,831	792,958	203,617	434,505	169,766	0	0	0	0	0	0	NA	792,958	792,958	0
2023	4,240,856	1,853,914	848,465	208,602	446,478	162,696	0	0	0	0	0	0	NA	848,465	848,465	0
2024	4,053,183	1,937,536	907,858	218,295	462,273	155,214	0	0	0	0	0	0	NA	907,858	907,858	0
2025	3,859,287	1,991,272	971,408	228,619	475,267	148,114	0	0	0	0	0	0	NA	971,408	971,408	0
2026	3,691,423	2,031,616	1,039,407	239,940	487,505	142,414	0	0	0	0	0	0	NA	1,039,407	1,039,407	0
2027	3,569,073	2,062,595	1,112,165	251,976	499,354	138,820	0	0	0	0	0	0	NA	1,112,165	1,112,165	0
2028	3,508,792	2,111,165	1,190,017	261,496	511,121	137,410	0	0	0	0	0	0	NA	1,190,017	1,190,017	0
2029	3,497,672	2,163,477	1,273,318	274,658	526,071	138,136	0	0	0	0	0	0	NA	1,273,318	1,273,318	0
2030	3,546,378	2,210,028	1,362,450	286,698	539,004	141,422	0	0	0	0	0	0	NA	1,362,450	1,362,450	0
2031	3,665,923	2,258,279	1,457,822	299,464	552,820	147,663	0	0	0	0	0	0	NA	1,457,822	1,457,822	0
2032	3,865,413	2,304,015	1,559,870	312,694	566,737	157,296	0	0	0	0	0	0	NA	1,559,870	1,559,870	0
2033	4,157,995	2,340,918	1,669,061	328,202	581,605	171,032	0	0	0	0	0	0	NA	1,669,061	1,669,061	0
2034	4,566,977	2,360,358	1,785,895	344,699	595,263	189,917	0	0	0	0	0	0	NA	1,785,895	1,785,895	0
2035	5,122,393	2,420,108	1,898,211	290,898	230,999	204,896	5,327,289	0	0	53,846	378,542	8,563	1,898,211	1,910,908	1,898,211	11,657
2036	0	2,512,344	1,987,402	286,807	238,135	0	5,768,240	0	0	52,929	390,235	239,506	1,987,402	2,044,672	1,987,402	31,002
2037	0	2,590,796	2,062,374	283,164	245,258	0	6,450,910	0	0	52,296	401,907	267,031	2,062,374	2,187,799	2,062,374	51,137
2038	0	2,660,276	2,129,112	278,872	252,292	0	7,172,144	0	0	51,748	413,435	296,098	2,129,112	2,340,945	2,129,112	70,270
2039	0	2,721,035	2,187,516	273,868	259,651	0	7,933,425	0	0	51,056	425,494	326,775	2,187,516	2,504,811	2,187,516	90,946
2040	0	2,796,228	2,262,678	266,267	267,283	0	8,736,750	0	0	50,001	438,000	359,134	2,262,678	2,680,148	2,262,678	113,018
2041	0	2,872,303	2,339,114	257,585	275,604	0	9,583,885	0	0	48,726	451,635	393,265	2,339,114	2,867,758	2,339,114	138,487
2042	0	2,943,653	2,410,945	248,910	283,798	0	10,477,512	0	0	47,458	465,063	429,250	2,410,945	3,068,501	2,410,945	164,416
2043	0	3,028,693	2,498,640	237,908	292,145	0	11,419,282	0	0	45,868	478,741	467,161	2,498,640	3,283,296	2,498,640	192,300
2044	0	3,123,275	2,596,957	225,369	300,949	0	12,411,053	0	0	43,883	493,169	507,078	2,596,957	3,513,127	2,596,957	222,806
2045	0	3,237,251	2,716,356	210,955	309,940	0	13,455,182	0	0	41,521	507,902	549,088	2,716,356	3,759,046	2,716,356	255,868
2046	0	3,362,728	2,848,301	195,270	319,157	0	14,553,693	0	0	38,863	523,007	593,275	2,848,301	4,022,179	2,848,301	291,160
2047	0	3,483,475	2,975,158	179,769	328,548	0	15,708,839	0	0	36,221	538,397	639,733	2,975,158	4,303,732	2,975,158	328,676
2048	0	3,606,432	3,105,068	163,641	337,723	0	16,923,189	0	0	33,486	553,432	688,551	3,105,068	4,604,993	3,105,068	366,797
2049	0	3,731,146	3,236,827	147,071	347,248	0	18,198,658	0	0	30,575	569,039	739,821	3,236,827	4,927,343	3,236,827	407,706
2050	0	3,850,310	3,362,919	130,659	356,732	0	19,538,093	0	0	27,699	584,582	793,649	3,362,919	5,272,257	3,362,919	449,966
2051	0	3,966,859	3,486,489	114,092	366,278	0	20,944,023	0	0	24,756	600,225	850,138	3,486,489	5,641,315	3,486,489	493,964
2052	0	4,082,147	3,608,708	97,486	375,953	0	22,419,143	0	0	21,752	616,079	909,397	3,608,708	6,036,207	3,608,708	539,899
2053	0	4,195,890	3,728,439	81,707	385,744	0	23,966,371	0	0	18,699	632,124	971,544	3,728,439	6,458,741	3,728,439	587,726
2054	0	4,306,646	3,843,312	67,680	395,654	0	25,588,737	0	0	15,765	648,363	1,036,702	3,843,312	6,910,853	3,843,312	636,298
2055	0	4,411,411	3,950,709	54,937	405,765	0	27,289,567	0	0	13,112	664,932	1,105,011	3,950,709	7,394,613	3,950,709	683,819
2056	0	4,501,565	4,041,504	43,738	416,323	0	29,072,623	0	0	10,704	682,234	1,176,628	4,041,504	7,912,236	4,041,504	730,776
2057	0	4,578,748	4,117,411	33,996	427,341	0	30,942,188	0	0	8,577	700,289	1,251,726	4,117,411	8,466,093	4,117,411	777,332

<sup>a</sup> Employer contributions paid from the City's General Fund are used to finance benefits not covered by the applicable employee contributions or premium tax allocation.

<sup>b</sup> Assets accumulate in the Pension and Relief Fund.

<sup>c</sup> Includes transfer from Benefit Payment Account to Accumulation Account in Plan Year End June 30, 2035.

<sup>d</sup> Blended employee contribution rate of 9.16% of pay less 1.50% of pay going into the Accumulation Account.